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UNITED STATES STEEL CORPORATION.

ORGANIZATION OF THE GIANT CONCERN THAT ABSORBS THE CARNEGIE AND ALL THE LARGE STEEL COMPANIES—ROCKEFELLER PROPERTIES NOT INCLUDED—CAPITAL, TERMS OF STOCK TRANSFER, ETC.

Probably the greatest surprise in connection with details of the United States Steel Corporation, now quite reliably set forth and in some respects officially announced, is the statement that "the Rockefeller mines and ships on the great lakes will not go into the combination immediately, but will probably be taken over later on." Immediately following the first intimation of negotiations for the formation of this great corporation it was expected that the Rockefeller interest would at least take a prominent part in the finances, but the definite announcements now at hand do not in any way bear out this expectation. The Consolidated iron mines, controlled to the extent of probably four-fifths of its stock by Mr. Rockefeller, owns more Lake Superior ore property than several of the other large steel corporations put together, and also owns the Duluth, Mesabi & Northern Railway, one of the most profitable of the ore roads in the Lake Superior region. This corporation also owns in fee several of very large ore mines of the Mesabi range that are leased by the Carnegie and other companies, and which leases are thus transferred to the new steel consolidation. The Consolidated iron mines is, therefore, together with some fifty-five or fifty-six Rockefeller ships on the great lakes, a very important factor outside of the big consolidation.

The first reliable information regarding this world's greatest industrial organization, to be known as the United States Steel Corporation, followed the publication of the articles of incorporation at Trenton, N. J., on Monday last. The capital was nominally placed at $3,000 and the incorporators were William J. Curtis, Charles McVeagh and Charles C. Cluff. The former two are lawyers and the latter is the general eastern agent of the Illinois Steel Co. The announcement of the incorporation had a decidedly bullish effect upon the stocks of the constituent companies. The outstanding securities of the various companies admitted to the combination are as follows:

American Steel Hoop	$14,000,000
American Tin Plate	46,325,000
American Sheet Steel	52,000,000
National Tube	80,000,000
National Steel	59,000,000
American Steel & Wire	90,000,000
Carnegie Company	316,000,000

The new company is to be eventually capitalized at $1,100,000,000, the terms of the charter being such as to permit of an indefinite increase in capitalization. Of the stock, $400,000,000 will be 7 per cent. preferred and $400,000,000 will be common. Bonds amounting to $300,000,000 and bearing 5 per cent. interest will be issued. These bonds will be largely used to buy out Mr. Carnegie's interest in the Carnegie company. He will not have a dollar's worth of stock, nor will he be given a cent in cash. His present stock in the Carnegie company, amounting to $86,379,000, will be paid for by about $130,000,000 of bonds; $160,000,000 of the bonds will be issued to redeem the $160,000,000 worth of Carnegie company's bonds now outstanding. The $400,000,000 7 per cent. preferred stock will be used to buy the preferred stock of the various companies and the $400,000,000 of common stock to buy their common stock. There is really no positive statement as to what Mr. Carnegie is to receive. The best information is to the effect that he will get $1,300 a share for his stock, the par value of which is $1,000. Neither is there an official announcement regarding the settlements to be made with minority stock holders of the Carnegie company, but it is more than probable that they will receive for their holdings $1,500 a share in the common stock of the new company and an equal amount of the preferred stock, or about $110,431,500 of each kind of stock. Charles M. Schwab will be the president of the new company and Henry C. Frick will be the chairman of the board of directors.

BASIS OF TRANSFERS—OFFICIAL ANNOUNCEMENT.

As regards the basis upon which securities of the various companies other than the Carnegie (not a stock exchange security) will ultimately be received for conversion into the securities of the new corporation, an official statement was made so as to forestall Wall street manipulators. Following is the offer made for stock of the several companies named:

	New preferred.	New common.
Federal Steel, preferred	1.10	....
Federal Steel, common	.04	1.07½
Am. Steel & Wire, preferred	1.17½	....
Am. Steel & Wire, common	....	1.02½
National Tube, preferred	1.25	....
National Tube, common	.088	1.25
National Steel, preferred	1.25	....
National Steel, common	....	1.25
Am. Tin Plate, preferred	1.25	....
Am. Tin Plate, common	.20	1.25
American Steel Hoop, preferred	1.00	....
American Steel Hoop, common	....	1.00
American Sheet Steel, preferred	1.00	....
American Sheet Steel, common	....	1.00

As to the stocks of the last four companies, Mr. Morgan explained that the aggregate amount of stocks so to be offered was arranged with the principal stockholders of those companies, who have requested the distribution of such amount among the four companies to be made in the percentages as stated. This means that for 100 shares of Federal Steel preferred 110 shares of United States Steel preferred will be exchanged; and so on. It will be seen that Federal Steel common, National Tube common and American Tin Plate common get a bonus of preferred stock. That is to say: Every holder of 100 shares of Federal Steel common will receive 107½ shares of the common stock of the new company and four shares of the new preferred stock.

It was also explained by Mr. Morgan that this arrangement regarding the particular stocks mentioned should not be regarded as a bonus, but rather as an estimated value of the old common shares as compared with common shares of the new company for which they are to be exchanged. In determining the basis of exchange, it was assumed by the negotiators that the common stock of the new company is worth 40 and the preferred stock par. Measured by this standard, arbitrary as it is admitted to be, two and one-half shares of the new common are worth one share of the new preferred. Employing this standard for the purpose of further comparing values, it is found that the holders of 100 shares of the common stock of Federal Steel, National Tube and American Tin Plate would receive, respectively, in the common stock of the new company, 117½ shares, 147 shares and 175 shares.

Another official announcement was to the effect that the exchange would be made of the preferred shares of all the combining companies as if the actual exchange were made on April 1, so that the dividends, all of which are cumulative, accruing on that date will be paid to the stockholders of record. If there be any dividends on the common stock, they will be adjusted according to the rules of the New York stock exchange. It was also stated that there will be no division of treasury assets in taking over the stock of the old companies.

Following these announcements, both classes of stock in the new organization were traded in largely in the outside securities market in New York Wednesday and the preferred, which sold up to 87 and down to 82, closed at 82½, while the common sold up to 40 and down to 37 and closed at 37¾.

PROVISIONS OF SWEEPING CHARTER.

"To manufacture iron, steel, manganese, coke, copper, lumber and other materials and all or any articles consisting or partly consisting of iron, steel, copper, wood or other materials, and all or any product thereof. To acquire, lease, own, occupy, use or develop any lands containing coal or iron manganese, stone or other ores or oil and any woodlands or other lands for any purpose of the company. To mine, or otherwise to extract or remove coal, ores, stone and other minerals and timber from any lands owned, acquired, leased or occupied by the company, or from any other lands. To buy and sell, or otherwise to deal or to traffic in, iron, steel, manganese, copper, stone, ores, coal, coke, wood, lumber and other materials and any part of the product thereof and any articles consisting or partly consisting thereof.

"To construct bridges, buildings, machinery, ships, boats, engines, cars and other equipment, railroads, docks, slips, elevators, water works, gas works and electric works, viaducts, aqueducts, canals and other waterways and any other means of transportation, and to sell the same or otherwise to dispose thereof, or to maintain or operate the same, except that the company shall not maintain or operate any railroad or canal in the state of New Jersey. To apply for, obtain, register, purchase, lease or otherwise to acquire and to hold, own, operate and introduce, and to sell, assign or otherwise to dispose of any trade marks, trade names, patents, inventions, improvements and purchases used in connection with or secured under letters patent of the United States, or elsewhere, or otherwise, and to use, exercise, develop, grant, license in respect of, or otherwise to turn to account any such trade marks, patents, licenses, processes, and the like, or any such property or rights. To engage in any other manufacturing, mining, construction or transportation business of any kind or character whatsoever, and to that end to acquire, hold, own and dispose of any and all property, assets, stocks, bonds and rights of any and every kind, but not to engage in any business here under which shall require the exercise of the right of eminent domain within the state of New Jersey.

"To acquire by purchase, subscription or otherwise and to hold and dispose of stocks, bonds or any other obligations of any corporation formed for or then or therefore engaged in pursuing any one or more of the kinds of business, purposes, objects or operations above indicated, or owning or holding any property of any kind herein mentioned; or of any corporation owning or holding the stock or the obligations of any such corporation. To hold for investment or otherwise, to use, sell or dispose of any stock, bonds or other obligations of any such other corporation, to aid in any manner any corporation, whose stock, bonds or other obligations are held or are in any manner guaranteed by this company, and to do any other acts or things for the preservation, protection, improvement or enhancement of the value of any such stock, bonds or other obligations, or to do anything or acts designed for any such purpose, while owner of any such stocks, bonds or other obligations to exercise all the rights, powers and privileges of ownership thereof and to exercise any and all voting powers thereon.

"The business or purpose of this company is from time to time to do any one or more of the acts herein set forth; and it may conduct its business in other states and in the territories and foreign countries, and have one office and keep the books of the company outside the state of New Jersey, except as otherwise may be provided by law; and may hold, purchase, mortgage and convey real and personal property, either in or out of the state of New Jersey. Without in any particular limiting any of the objects and powers of the corporation it is hereby expressly declared and provided that the corporation shall have power to issue bonds and other obligations in payment for property purchased or acquired by it, or for any other object in or about its business; to mortgage or pledge any stocks, bonds or other obligations of any property which may be acquired by it to secure any bonds or other obligations by it issued or incurred furthering any of its objects to do any and all other acts and things and to exercise any and all other powers of a copartnership or person.

UNITED STATES THE LEADING EXPORT NATION.

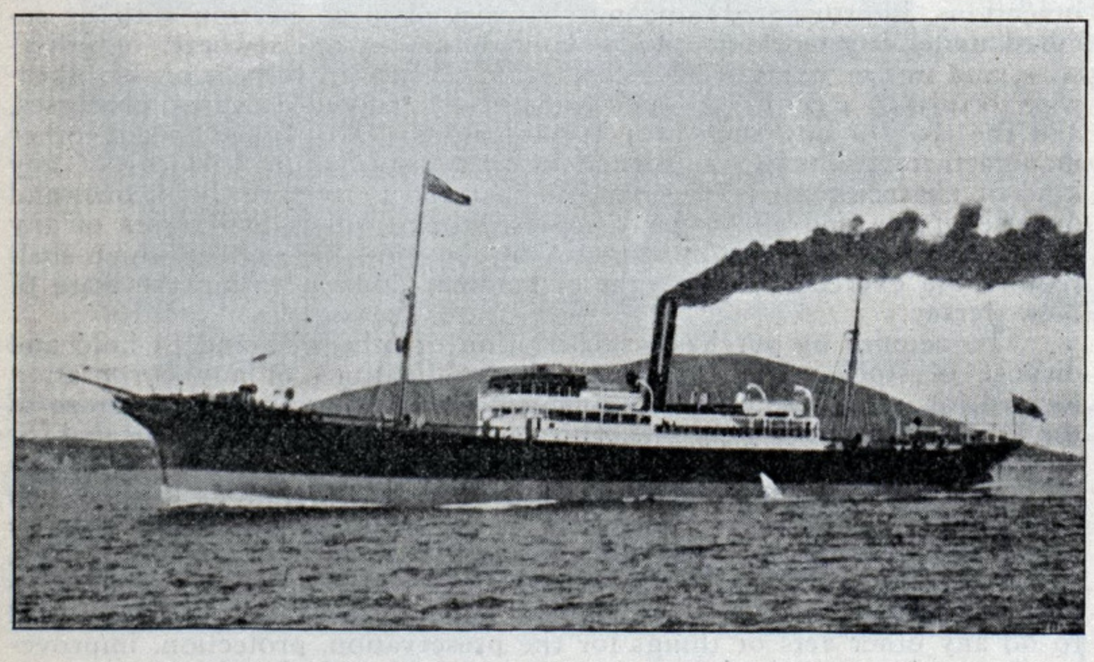
The United States now stands at the head of the world's exporting nations. The complete figures for the calendar year 1900 when compared with those of other nations show that our exports of domestic products are greater than those of any other country. The total exports of domestic merchandise from the United States in the calendar year 1900 aggregated $1,453,013,659, those from the United Kingdom, which has heretofore led in the race for this distinction, $1,418,348,000, and those from Germany $1,050,611,000. Additional interest is given to the first rank, which the United States now holds as an exporting nation by the fact that a quarter of a century ago she stood fourth in that list. In 1875 the domestic exports of the United States were $497,263,737; those of Germany $607,096,000; those of France $747,489,000, and those of the United Kingdom $1,087,497,000. Today the United States stands at the head of the list, the United Kingdom second, Germany third, and France fourth, with the figures as follows: United States, $1,453,013,659; United Kingdom, $1,413,348,000; Germany, $1,050,611,000; France, $787,060,000. All of these figures, it should be remembered, relate to the exports of domestic products. Thus in the quarter century, the United States has increased her exports from $497,263,737 to $1,453,013,659, or 192 per cent.; Germany from $607,096,000 to $1,050,611,000, or 73 per cent.; the United Kingdom from $1,087,497,000 to $1,418,348,000, or 34 per cent., and France from $747,489,000 to $787,060,000, or 5 per cent.

The following table, compiled from official reports, shows the exports of domestic merchandise from the United States, the United Kingdom and Germany in each calendar year from 1875 to 1900:

Year.	United States.	United Kingdom.	Germany.
1875	$497,263,737	$1,087,497,000	$607,096,000
1876	575,735,804	976,410,000	619,919,000
1877	607,566,495	967,913,000	672,151,000
1878	723,286,821	938,500,000	702,513,000
1879	754,656,755	932,090,000	675,397,000
1880	875,564,075	1,085,521,000	741,202,000
1881	814,162,951	1,138,873,000	724,379,000
1882	749,911,309	1,175,099,000	776,228,000
1883	777,523,718	1,166,982,000	796,208,000
1884	733,768,764	1,134,016,000	779,832,000
1885	673,593,506	1,037,124,000	695,892,000
1886	699,519,430	1,035,226,000	726,471,000
1887	703,319,692	1,079,944,000	762,897,000
1888	679,597,477	1,141,365,000	780,076,000
1889	814,154,864	1,211,442,000	770,537,000
1890	845,999,603	1,282,474,000	809,810,000
1891	957,333,551	1,203,169,000	772,679,000
1892	923,237,315	1,105,747,000	718,806,000
1893	854,729,454	1,062,162,000	753,361,000
1894	807,312,116	1,051,193,000	720,607,000
1895	807,742,415	1,100,452,000	807,328,000
1896	986,830,080	1,168,671,000	857,745,000
1897	1,079,834,296	1,139,882,000	884,486,000
1898	1,233,564,828	1,135,642,000	894,063,000
1899	1,253,466,000	1,287,971,039	1,001,278,000
1900	1,453,013,659	1,418,348,000	1,050,611,000

FURNESS-WITHY LINER LOYALIST.

The Furness-Withy line has just added two excellent vessels to its London, Nova Scotia and New Brunswick service. The vessels are the Loyalist and the Evangeline. The Loyalist has just undergone a trial trip when a speed of 15 knots was obtained. The vessels are of a beautiful, yacht-like appearance and are decidedly in advance of anything engaged at present in that trade. The dimensions of both are 383 ft. by 45 ft. by 30½ ft. and they have accommodations of handsome design for a large number of first and second-class passengers. Both vessels were built by Messrs. Alex. Stephen & Sons, Ltd., Linthouse, Glasgow.



FURNESS-WITHY LINER LOYALIST.

Two dry docks in course of construction at Liverpool will each accommodate the largest ships yet built or contemplated and have plenty of room to spare. The Canada dock, almost ready for use, is 925 ft. 6 in. in length, 124 ft. 2 in. wide at the top and 94 ft. wide at the bottom. The entrance is 94 ft. in width and carries 32 ft. of water over the sill. The material is Portland cement and concrete in parts of eight to one, finished with parts of six to one. The dock has three centrifugal pumps, capable of discharging 3,500,000 cub. ft. of water in 1½ hours. The second dock is 1,000 ft. in length, with 95 ft. width of entrance, and will have 37 ft. depth of water over the sill.

BRITISH VIEW OF OUR SHIPPING QUESTION.

Fairplay of London, always intensely British and continually disturbed by American progress in foreign trade, prints the following comment on an article by Charles H. Cramp in the Daily Mail regarding shipping legislation in this country:

"That eminent American ship builder, Mr. Charles H. Cramp, has written a long letter, which recently appeared in the Daily Mail. The letter as a whole requires no particular comment, but one paragraph shows either the existence of a misconception in the mind of the writer, or of a desire, which I am quite sure does not exist, to mislead the ubiquitous readers of the Mail. In the course of the letter appears the following: 'I have said that the civil war was a misfortune to American ship builders. That war annihilated our commercial fleet, both in sail and steam. Some of these ships were bought by our own government; others were destroyed by those in arms against it. The remainder were transferred to foreign flags. At the end of the war the business of owning and operating ships in this country had passed away and no effort was made to revive it. Our ocean carrying trade had gone into other hands, and there was no demand for new ships, for the reason that no one cared to undertake the risk of the shipping business under the conditions then obtaining. To make a bad matter worse, our government adopted the policy of doing its own naval work. In addition to this, all legislation for the first ten years after the war was adverse to American shipping interests, and therefore favorable to the interests of foreign ship owners.'

"This would imply that the disappearance of the American flag from the oversea trade was due to incidents connected with the civil war. So far as the capture of some few American ships was concerned, the collapse of the American shipping trade might have been precipitated to that extent; but Mr. Cramp forgets to state, what I am sure he must very well know, that the American war synchronized with the introduction of steam, and particularly of iron vessels into the sea-going trade. The change from sail to steam began to assume a marked development at about that period. Iron cargo steamers were found more profitable than wooden sailing ships, and the American trade at that time was carried on entirely by the latter class of vessels. But if iron steamers were to be used to supersede sailers, they had to be procured from where they could be produced, and at that period of the world's history the only country capable of turning out vessels of that class was our own. As a matter of fact Great Britain, which at this moment still holds an immense supremacy in respect of the cheap and rapid construction of iron and steel steamers, was at that time the sole builder of such vessels. America has lately gone into that line of business, with, I am afraid I must say, not very marked success from a financial point of view. At any rate the whole outturn of American ship building for the foreign trade, as contrasted with that of our own country, is ridiculously small, and more than one generation must pass before American ship building appliances can be sufficiently developed to place that country in the rank of a dangerous competitor in iron and steel ship building with this country.

"The American coasting trade, an enormous trade, is as completely in the hands of our cousins over the water as ever it was; neither from all that I can see is their supremacy in that respect likely to be interfered with, because, having a monopoly, they are just the sort of people to keep it. But to retain a monopoly already possessed is a very different thing from attacking a monopoly in the hands of others, and this is the task on which Mr. Cramp would appear to propose to enter with a light heart. That he should wish to do so is natural, because, as a ship builder, he would be developing his own business; but the question is whether the comparatively limited profits which are derived from ship building, and especially from ship owning, will be sufficient to satisfy American capitalists, who hitherto have found more advantageous outlets for their money. The ship builders who have made large fortunes in this country in the course of something like two generations can be counted on the fingers of both hands, while those who have found the money for the ships would in a vast number of cases have done better if they had invested in consols. This is a side of the question with which Mr. Cramp at present has not dealt. It is quite true that he contemplates a state subvention, but it remains to be seen whether the American taxpayers will be willing to accept the burden to be imposed on them."

HISTORY OF THE SUNKEN RIO DE JANEIRO.

The steamer Rio de Janeiro, which was wrecked by endeavoring to enter San Francisco harbor during a fog, was one of a fleet of Pacific Mail steamships built at Roach's ship yard, Chester, Pa., although she was not contracted for by the Pacific company at the time of her building. In 1877 the late John Roach conceived the idea that a fleet of first-class American ships running to South American ports would build up American trade in that section and prove a profitable investment, and he organized a company among his friends and built and equipped two fine ships for the trade as his share of the capitalization. It was believed that congress would aid the enterprise by giving the line a subsidy for carrying the mail, and the new ships Rio de Janeiro and City of Para were built for the service.

The Rio de Janeiro was launched on March 6, 1878, and just one month later, on April 6, the City of Para was launched. This was a great occasion in Chester, and President Hayes and several members of his cabinet were present as the guests of the veteran ship builder. President Hayes stood on the deck of the Rio de Janeiro, and from this point of vantage saw the Para slide down the ways. In speaking of the loss of the Rio de Janeiro, John B. Roach, president of the ship building company, said:

"The rapid sinking of the ship was due to the fact that she was not built as modern ships are, with water tight bulkheads dividing the vessel into comparatively small compartments. At the time the Rio was built this practice of insuring the safety of vessels had not been developed as it is today. The Rio was a stanch and steady ship, splendidly constructed, and had proved her seaworthiness in a dozen typhoons, but the lack of water tight bulkheads was a fatal defect in case the ship struck a reef which tore a large hole in her."

The question of submarines has occupied the attention of the British admiralty for some time. The first lord of the admiralty will make a statement on the subject to the house of commons in a short time.

WORLD'S MERCHANT MARINE.

PRODUCTION HAS FOUND A MIGHTY ALLY IN THE MEANS OF TRANSPORTATION—THE SHIP BUILDING INDUSTRY.

The Frankfurter Zeitung of recent date, contains an article devoted to the merchant marine of the world and to the ship building industry, which presents some interesting observations and data. Attention is called to the fact that the enormous growth of production has found a mighty ally in the means of transportation, which have kept pace with it. Without railroads and steamships, the production of cereals in North America and Australia would not have been so widely developed, as the products could not have been utilized, except by immigration from overpopulated countries; nor would the gigantic metal, textile, and other industries of Germany have attained their present growth. The expansion of ocean navigation and the resultant lowering of freights is regretted by the German agrarians, as it has cost them the loss of monopoly in the production of articles of food which they formerly enjoyed; at the same time it is the cause of the marvelous growth of German industries, not only for export, but also for home consumption, because the development and improvement of ocean navigation supplied the demand for raw materials at reduced cost. Ocean freight rates have been lowered on an average of from 50 to 75 per cent. The rates, for instance, were:

	1874.	End of 1900
From England to—		
Buenos Ayres (for coal)	$9.73	$2.43
Rio de Janeiro	6.30	3.41
Alexandria	4.38	1.70
Odessa	4.26	1.58
To England from—		
Quebec:		
Lumber	21.42	4.62
Boards	25.55	9.73
Valparaiso (saltpeter)	13.38	5.84
San Francisco (wheat)	13.99	5.41
Rangoon (rice)	13.38	5.48

At present, rates are somewhat higher than at the close of 1900, but nevertheless much lower than between 1870 and 1880. These lower rates are mainly due to improvements in ship building. The tonnage is now considerably greater without a proportionate increase in the cost of running. Up to twenty years ago, the men on sailing vessels had to go up the masts to set the sails or to reef; on new ships, this is done automatically, which, while being safer, requires less labor. The steamers now use triple and quadruple expansion engines, thereby greatly lessening the duration of the voyage; these and improved furnaces save much fuel for the trips, while the less amount of coal required gives more storage for freight. The freight capacity of modern steamers has increased fully one-third, while the expense has been reduced. The merchant steam marine of the world has grown immensely, as the following figures illustrate:

MERCHANT STEAM MARINE OF THE WORLD.

Year.	Number of vessels.	Registered tons. Gross.	Net.
1874	5,865	5,226,000	3,471,000
1884	8,433	10,209,000	6,675,000
1894	10,744	15,657,000	9,994,000
1896	11,155	17,089,000	10,761,000
1898	11,576	18,887,000	11,687,000
1899	11,756	19,711,000	12,165,000
1900	12,289	21,787,000	13,465,000

The steam fleet, in numbers, has a little more than doubled in twenty-six years; in tonnage, it has quadrupled. The reverse has been true of sailing vessels. In this case, there is hardly any difference between the gross and net tonnage.

MERCHANT SAILING VESSELS OF THE WORLD.

Year.	Number of vessels.	Registered tons.
1874	56,289	14,523,000
1884	44,734	13,000,000
1894	29,333	9,547,000
1896	29,248	9,136,000
1898	28,885	8,693,000
1899	27,867	8,347,000
1900	27,982	8,205,000

In the short space of twenty-six years, the transportation capacity of the world's merchant marine has increased 250 per cent. The growing importance of the part which Germany takes in this line of trade has often been pointed out. Germany today, not only with reference to merchant steamers, but also to the world's merchant fleet, occupies the place next to Great Britain, which is all the more notable as the United States includes in its tonnage the vessels on the great lakes. The relative position of the principal flags in the fall of 1900 was:

Country.	Steamers. Tons.	Sailing vessels. Tons.	Total. Tons.
England	11,859,000	2,513,000	14,362,000
Germany	2,169,000	551,000	2,720,000
United States	1,183,000	1,360,000	2,543,000
Norway	769,000	898,000	1,667,000
France	1,060,000	341,000	1,401,000
Great Britain	1,192,000	12,000	1,204,000
United States	142,000	13,000	153,000
Germany	147,000	5,000	152,000
Italy	103,000	1,000	104,000
France	63,000	55,000	118,000
Holland	26,000	8,000	34,000

In the years 1898 and 1899 Germany held second place in ship building, but, for various reasons, the ship building in 1900 has received such an impetus in the United States that it has placed Germany third.

England owns considerably more than half of all the steamers in the world. In the building of ships, that country makes a still better showing. British ship yards work in a very large measure for foreign countries. At the end of the third quarter of 1900, there were being constructed:

DECISION IN ANOTHER OF THE TUG ASSOCIATION CASES.

Mr. John D. Sloane, United States supervising inspector of steam vessels in the district that includes Duluth has passed upon another case that grew out of the action of the tug men at Duluth who refused in some instances to work with men who were not members of the Licensed Tugmen's Protective Association. The decision is as follows:

To Messrs. Monaghan and Chalk, United States Local Inspectors, Duluth, Minn.: Gentlemen—On Jan. 4, 1901, I received your communication under date of Jan. 3, 1901, stating that you were unable to agree upon a decision in the matter of complaint of Walter W. Wood against Arthur Van Alstine, engineer on the ferry steamer Estelle, for refusing to serve in his official capacity on said steamer Oct. 18, 1900, with Mate Walter W. Wood, for the reason that said Wood was not a member of the Licensed Tugmen's Protective Association of Duluth, requesting me to decide the case as provided in section 4452, United States revised statutes. The complainant, Walter W. Wood, states "that on the morning of Oct. 18, 1900, he reported for duty on the ferry steamer Estelle, a duly enrolled and licensed vessel, and that he was met by George Wilson, engineer of said steamer, who informed complainant that the Licensed Tugmen's Protective Association of Duluth had passed resolutions the previous evening directing the said Wilson not to serve as engineer on the steamer Estelle if complainant, Walter W. Wood, attempted to perform the duties of pilot thereon; that said George Wilson then informed complainant that he would not obey any signals received from complainant, for the reason that complainant was not a member of said association of which George Wilson was a member. Complainant again went on board said vessel about 6 o'clock p. m. and demanded of said Wilson and Van Alstine, engineers, a written statement of why they refused to sail with him on said vessel; that Van Alstine then informed complainant that he would not serve as engineer on said vessel if complainant was employed thereon, for the reason that complainant was not a member of the Licensed Tugmen's Protective Association, of which said Van Alstine was a member, and that said Arthur Van Alstine and George Wilson each severally refused to give complainant a written reason why they would not obey affiant's signals and serve as engineer under his pilotage, and that thereupon the master of said vessel informed complainant that owing to the arbitrary conduct of said George Wilson and said Arthur Van Alstine in refusing to sail with complainant, and their refusal to obey his signals, said master was unable longer to hire complainant as pilot of said steamer, and that by reason of said arbitrary and unlawful conduct of George Wilson and Arthur Van Alstine complainant was discharged from his employment on said steamer Estelle and has ever since been unable to obtain employment thereon."

According to the testimony of Walter W. Wood, the complainant, when he visited the steamer Estelle on the morning of Oct. 18, 1900, he met Capt. Cole and said "I will take her." Capt. Cole then said that he had been on nights all the season and would stay on during the day, and Wood then said, "All right, I am not particular about that," and then went and saw the engineer. The only inference to be deduced from this testimony is that Wood gave up the day trip on that day because Capt. Cole preferred day work and Wood consented; so any failure to work that day did not arise from the refusal of the defendants to perform their duty. Wood further testifies that he then went and talked with Wilson, who said: "The committee came down from the association and we concluded that you could not sail with us . . . . . under order of executive committee could not let you ride on this boat." If this statement of Wilson had resulted in any hindrance to commerce and the evidence of Wood in this respect was true, in my opinion Wilson would have committed an offense under section 4449, United States revised statutes, but the fact is Wood had already consented to let Capt. Cole go out on that day. It is true that Wood was soon after discharged by Capt. Ryan, but it nowhere appears affirmatively and clearly that it was on account of Wilson's statement. According to Ryan's statement, he discharged Wood in fear that the association would tie up his steamer, and he gives no other reason. Wood further testifies that he went back in the evening and demanded written reasons from the engineers, Wilson and Van Alstine, for refusing to sail with him, and that Van Alstine replied "it is none of my——business." This is the only evidence connecting Van Alstine with the complaint, and the evidence of others makes it doubtful whether the words, or words like these in substance, were not addressed to the fireman. This is in substance the incriminating evidence of Capt. Wood, and I think it insufficient to sustain the complaint. This being so, it is unnecessary to consider the other evidence for the defense, or that of Oleson. If these defendants refused to perform their duty for the reason alleged, it is to be regretted that Capt. Wood did not stand upon his rights, offer to perform his duties and get an explicit reason for his discharge from Capt. Ryan. It almost seems as if he acquiesced in leaving because someone had objected to his remaining, instead of standing upon his legal rights, but be that as it may, men can only be convicted of an offense by testimony which carries conviction to the mind, and, in my opinion, there is not a particle of evidence showing any delay or detention of this steamer. I therefore dismiss the complaint.

JOHN D. SLOANE,
Supervising Inspector Fifth District.

Dubuque, Ia., Feb. 21, 1901.

Tracings are now being copied in Europe by electric light. A circular frame of the Shaw & Halden's patent is used. A current of 10 amperes, with a voltage of 100, is used, and in a very few seconds a good print is made.

MASTERS AND ENGINEERS OF LAKE VESSELS.

American Steamship Co., A. B. Wolvin, Mgr., Duluth, Minn.: Steamers—Zenith City, Capt. D. P. Wright, Engineer R. B. Hodge; Queen City, Capt. Wm. Pardo, Engineer A. L. Eggert; Crescent City, Capt. A. R. Robinson, Engineer Chas. Burke; Empire City, Capt. R. F. Humble, Engineer Frank Mansfield; Superior City, Capt. James Leiske, Engineer Frank Schwartz; W. H. Gilbert, Capt. R. J. Cowley, Engineer A. McGillevray; John W. Gates, Capt. R. J. Lyons, Engineer Andrew Haas; James J. Hill, Capt. F. P. Houghton, Engineer Wm. Most; Isaac L. Ellwood, Capt. H. L. Mills, Engineer Geo. Lawrence; Wm. Edenborn, Capt. Geo. Bell, Engineer E. S. Stoddard; Wm. P. Palmer, Capt. Geo. Banker, Engineer Herman Dupont; A. B. Wolvin, Capt. Chas. Gegenheimer, Engineer Jos. Taylor.

Barry Steamboat Line, Miles Barry, Mgr., Chicago: Steamers—City of Fremont, Capt. Edward Evans, Engineer Chas. Grobben; F. & P. M. No. 1, Capt. Thos. Barry, Engineer Jos. Hitchcock; City of Grand Rapids, Capt. Albert Pittman, Engineer Geo. Carr; Gordon Campbell, Capt. Louis Larson, Engineer ———; State of Michigan, Capt. Davidson, Engineer Peter Kerr; Alice Stafford, Capt. Jos. Lamoreaux, Engineer Frank Barney; Robt. E. Burke, Capt. Peter Barry, Engineer ———; Sophia Minch, Capt. Richards, Engineer ———.

Detroit, Belle Isle & Windsor Ferry Co., Detroit: Steamers—Pleasure, Capt. John Wilkinson, Engineer Nicholas Huff; Promise, Capt. Robert Ferguson, Engineer Henry Free; Sappho, Capt. Geo. D. Horn, Engineer Henry Vaughn; Garland, Capt. M. McCune, Engineer ———; Fortune, Capt. D. Jacques, Engineer Fred Wolff; Excelsior, Capt. Fred Jarvis, Engineer S. G. Merrill; Victoria, Capt. Peter Williams, Engineer Walter Merrill.

Deseronto Nav. Co., Deseronto, Ont.: Steamers—Resolute, Capt. John Gowan, Engineer John Harrison; Reliance, Capt. James Dougherty, Engineer John Toppings; Deseronto, Capt. Wm. Skillin, Engineer Owen Flood; Ella Ross, Capt. D. B. Christie, Engineer John McFaul; Armenia, Capt. G. Arthurs, Engineer Thos. O'Neill; Rescue, Capt. John Rowe, Engineer ———; Ranger, Capt. H. Burnip, Engineer Wm. Stanhope.

Union Transit Co., H. C. French, Mgr., Buffalo: Steamers—J. M. Nicol, Capt. Wm. McLean, Engineer Geo. E. Tretheway; Eber Ward, Capt. John L. McIntosh, Engineer James Countryman; Avon, Capt. Norman McGuire, Engineer Jos. Jamieson; W. H. Stevens, Capt. Alex. Clark, Engineer J. E. McSweeney; Portage, Capt. John Tyrney, Engineer Geo. W. Haig; Jas. Fisk, Jr., Capt. John Pearson, Engineer Jos. Bouffard.

Minneapolis, St. Paul & Buffalo S. S. Co., J. C. Maclay, Gen. Mgr., Buffalo, N. Y.: Steamers—Minneapolis, Capt. Geo. Moore, Engineer D. J. McMillan; St. Paul, Capt. Peter Thompson, Engineer Henry Stone; Huron, Capt. W. Moore, Engineer Clinton Folkerts; Hennepin, Capt. C. D. Ross, Engineer Wm. Bridges; John Pridgeon, Jr., Capt. D. N. Sherwood, Engineer John Mogan.

Fitzgerald, W. E., Milwaukee: Steamers—Pueblo, Capt. Duncan Stalker, Engineer Alex. Staley; Denver, Capt. E. A. McGregor, Engineer John Smith; Topeka, Capt. D. Wilson, Engineer C. Beridschnider; Omaha, Capt. Whitney Carr, Engineer H. McLean; J. W. Westcott, Capt. J. D. Wanvig, Engineer H. G. Declute; Hennepin, Capt. C. D. Ross, Engineer Samuel Moore.

Midland Tug & Wrecking Co., Ltd., Midland, Ont.: Steamers—Magnolia, Capt. R. H. Gilbertson, Engineer Ed. House; Metamora, Capt. Jas. Tyndall, Engineer Ed. McLaughlin; Minitaga, Capt. Ed. Burke, Engineer Jas. McGregor; Menodora, Capt. Wm. Lediard, Engineer Jno. Kinney; Reliance, Capt. Frank Burke, Engineer Fred. Wilson.

Sinclair, Alex. R., Duluth, Minn.: Steamers—S. Langell, Capt. John Stewart, Engineer Robert Cameron; J. C. Suit, Capt. Edw. England, Engineer ———; H. A. Root, Capt. Wm. F. Thompson, Engineer ———. Schooners—Arenac, Capt. Wm. F. Horning; W. K. Moore, Capt. B. Warwick; Interlakin, Capt. Chas. Adams.

Northwestern Transportation Co., L. C. Waldo, Mgr., Detroit: Steamers—Harvey H. Brown, Capt. D. Girardin, Engineer L. M. Peck; Fayette Brown, Capt. Jos. A. Powell, Engineer Nicholas Anderson; S. R. Kirby, Capt. John F. Jones, Engineer Chas. E. Collins. Schooner—Geo. E. Hartnell, Capt. C. L. Allen.

Rhodes, R. R., Cleveland: Steamers—Minneapolis, Capt. Geo. Moore, Engineer D. J. McMillan; St. Paul, Capt. P. Thompson, Engineer Henry Stone; Wm. C. Rhodes, Capt. P. Dowdell, Engineer G. Hemenger; Huron, Capt. W. Moore, Engineer C. Folkerts; Yale, Capt. J. Jackson, Engineer Henry Stone.

Hutchinson, J. T., Cleveland: Steamers—Germanic, Capt. B. Fox, Engineer Malcom Jamison; Queen of the West, Capt. C. J. DeBeau, Engineer Geo. Baluvette; Rube Richards, Capt. Wm. Patterson, Engineer ———. Schooners—E. C. Hutchinson, Capt. John Martin; May Richards, Capt. Oscar Brown.

Brittain, R. C., Saugatuck, Mich.: Steamers—O. E. Parks, Capt. O. E. Parks, Engineer F. Redmer; Frank Woods, Capt. C. B. Coates, Engineer Henry Randall; Chas. McVea, Capt. Wm. Turnbull, Engineer Henry Bender; J. S. Crouse, Capt. R. C. Brittain, Engineer Sam Shaver.

Niagara Navigation Co., John Foy, Mgr., Toronto, Ont.: Steamers—Chippewa, Capt. J. McGiffen, Engineer Geo. M. Arnold; Corona, Capt. W. H. Holmes, Engineer Wm. Walsh; Chicora, Capt. R. Clapp, Engineer H. Parker; Anjiara, Capt. J. McIntyre, Engineer ———.

Stevenson, John, Detroit: Steamers—C. H. Starke, Capt. Wm. Crosby, Engineer John Lorey; Miami, Capt. H. Huyser, Engineer John Elsey; Shepheard, Capt. W. J. Joark, Engineer Jos. Meno; Hattie, Capt. N. Stewart, Engineer ———.

Graham & Morton Transportation Co., Chicago: Steamers—City of Chicago, Capt. Wm. Russell, Engineer Wm. McClure; City of Milwaukee, Capt. John Stewart, Engineer C. L. Barron; Mary, Capt. W. A. Boswell, Engineer Wm. Johnson.

Rice, W. E., Harbor Beach, Mich.: Steamer—Rhoda Stewart, Capt. Wm. J. Cowles, Engineer G. R. McLellan. Schooners—Wm. Brake, Capt. Fred Kirker; J. W. Hanaford, Capt. J. W. Hanaford; Golden Rule, Capt. Chas. Recor.

McKay, R. O. & A. B., Hamilton, Ont.: Steamers—Strathcona, Capt. John Irving, Engineer James Smeaton; Donnacona, Capt. E. S. Mintes, Engineer R. Duguid; Lake Michigan, Capt. A. Monpetit, Engineer Jos. Dawson.

Chicago, Saugatuck & Douglas Transportation Co., W. B. Griffin, Mgr., Saugatuck, Mich.: Steamers—Saugatuck, Capt. John Campbell, Engineer Wm. Bradley; Chas. McVea, Capt. Wm. Turnbull, Engineer Henry Bender.

Hope Transportation Co., J. A. Francombe, Mgr., Detroit: Steamer—W. R. Stafford, Capt. B. Chamberlain, Engineer J. A. Francombe. Schooners—Ed. McWilliams, Capt. Geo. Johnson; J. A. Francombe, Capt. ———.

Slyfield, A. B., Port Huron, Mich.: Steamer—White Star, Capt. A. B. Slyfield, Engineer ———. Schooners—Eva S. Robinson, Capt. Geo. Slyfield; Anna P. Grover, Capt. Geo. Bennett; John Miner, Capt. ———.

St. Lawrence & Chicago Steam Nav. Co., J. H. Hagerty, Mgr., Toronto, Ont.: Steamers—Algonquin, Capt. James McMaugh, Engineer Samuel Gillespie; Rosedale, Capt. James Ewart, Engineer E. O'Dell.

Jenkins, John, Marine City, Mich.: Steamer—W. H. Sawyer, Capt. John Jenkins, Engineer Nelson Goulette. Schooners—C. E. Redfern, Capt. Wyman Power; A. C. Tuxbury, Capt. J. C. Angell.

Republic Iron Co., Cleveland: Steamers—Republic, Capt. Wm. Megarvey, Engineer Wm. Lowe; Continental, Capt. W. A. Black, Engineer Allan W. McGregor. Schooner—Grace Holland, Capt. B. M. Landfair.

Cleveland & Buffalo Transit Co., T. F. Newman, Mgr., Cleveland: Steamers—City of Erie, Capt. Hugh McAlpin, Engineer J. G. Rendall; City of Buffalo, Capt. W. H. Smith, Engineer Chas. Lorimer.

Port Clinton Transportation Co., F. H. Rae, Mgr., Vermillion, O.: Steamer—Leland, Capt. F. H. Rae, Engineer ———. Schooners—Montgomery, Capt. Wm. Duff; Racine, Capt. G. E. Nelson.

Williams Trans. Co., H. W., So. Haven, Mich.: Steamers—City of Kalamazoo, Capt. David Morris, Engineer Chas. LaBounty; H. W. Williams, Capt. Frank Swails, Engineer Ralph Peterson.

Merchants Line, G. E. Jacques & Co., Mgrs., Montreal, Can.: Steamers—Cuba, Capt. John T. Towers, Engineer Wm. Kennedy; Melbourne, Capt. Arthur Lefebore, Engineer Thos. Milne.

McLachlan Trans. Co., Port Huron, Mich.: Steamer—Kittie M. Forbes, Capt. J. W. Montgomery, Engineer Fred Hatch. Schooner—Mary E. McLachlan, Capt. G. B. Fuller.

Wm. Livingstone, Detroit: Steamers—Wm. Livingstone, Capt. Wm. McAlpine, Engineer Alex. Morison; T. W. Palmer, Capt. Geo. F. Stephen, Engineer Jos. W. McKittrick.

Crosby Transportation Co., Muskegon, Mich.: Steamers—Naomi, Capt. Robert Hazelbarth, Engineer Alex. Currie; Nyack, Capt. J. C. Ackerman, Engineer Carl Halberg.

Keith & Co., J. G., Chicago: Steamers—Parks Foster, Capt. John Cochrane, Engineer James Taylor; Ira H. Owen, Capt. D. J. Duncanson, Engineer Wm. Beckbissinger.

Plathner, Theo., Milwaukee, Wis.: Steamer—Emma E. Thompson, Capt. Henry Bennett, Engineer Walter Kimber. Schooner—LaPetite, Capt. Wm. Glockner.

Donovan, Timothy, Oswego, N. Y.: Steamer—John E. Hall, Capt. Timothy Donovan, Engineer John Donovan. Schooner—John R. Noyes, Capt. Geo. Donovan.

Wallace & Cunningham Transit Co., James I. Wallace, President, Detroit, Mich.: Steamer—W. B. Morley, Capt. John McAlpine, Engineer John Volker.

Charlevoix Lumber Co., Charlevoix, Mich.: Steamer—Pine Lake, Capt. E. S. Small, Engineer John Chemock. Schooner—Naiad, Capt. Christ. Edwardson.

Becker, W. H., Cleveland: Steamers—W. F. Sauber, Capt. H. A. Stewart, Engineer C. J. Church; G. W. Roby, Capt. J. R. Preston, Engineer A. Stewart.

Sandusky Lumber & Box Co., Sandusky, O.: Steamer—Linden, Capt. J. H. Warwick, Engineer L. Hanson. Schooner—Chas. Wall, Capt. Dan Nathan.

Hahn, J. N., Mgr., Cleveland: Steamer—Jas. H. Shrigley, Capt. Jos. Albam, Engineer John S. Kelly. Schooner—Shawnee, Capt. T. L. Vandusen.

Jean August, Buffalo: Steamer—Samuel Marshall, Capt. Aug. Jean, Engineer Harry Baynton. Schooner—Tilden, Capt. John Burke.

Haynes, F. J., Port Huron, Mich.: Schooners—Charlie Crawford, Capt. Allen Curtis; Andrew Jackson, Capt. David Gleason.

Owen Trans. Co., J. Emory, R. T. Gray, Mgr., Detroit: Steamer—John Owen, Capt. E. F. Thorp, Engineer S. L. Phillips

Brown Steamship Co., H. H. Brown, president, Cleveland: Steamer—Castalia, Capt. C. C. Allen, Engineer Edward Dempsey.

Manitou Steamship Co., N. F. Leopold, President, Chicago: Steamer—Manitou, Capt. Allan McIntyre, Engineer Roy L. Peck.

Roby Trans. Co., L. C. Waldo, Mgr., Detroit: Steamer—L. C. Waldo, Capt. John W. Duddleson, Engineer F. E. Allen.

Nipigon Transit Co., Grosse Point, Mich.: Steamer—J. C. Ford, Capt. L. Morrison, Engineer Robert Dornan.

Hall, Capt. J. B., Hall & Root, Buffalo: Steamer—New Orleans, Capt. J. H. Coleman, Engineer P. H. Coniff.

Ionia Trans. Co., F. M. Thompson, Mgr., Detroit: Steamer—Ionia, Capt. Alex. Craigie, Engineer Thos. Brand.

Green Bay Vessel Co., Green Bay, Wis.: Steamer—Orion, Capt. Geo. H. Scott, Engineer E. M. Murdock.

Fairgrieve & Co., J. B., Hamilton, Ont.: Steamer—Arabian, Capt. O. Patenaude, Engineer Jas. H. Brown.

Buckley, Edward, Manistee, Mich.: Steamer—Edward Buckley. Capt. Chas. Gnewuch, Engineer Richard Winkler.

Loutit, W. H., Grand Haven, Mich.: Steamer—Pentland, Capt. Thos. McCambridge, Engineer C. Ball.

Pierce, Wm. E., West Bay City, Mich.: Steamer—Denton, Capt. W. E. Pierce, Engineer A. P. Hagadon.

Farwell, J. H., Detroit: Steamer—Jesse H. Farwell, Capt. John Duncanson, Engineer John W. Johnston.

Blodgett, W. C., Buffalo, N. Y.: Steamer—St. Joseph, Capt. Frank Conlin, Engineer Louis Plant.

Candler, H. & J., J. W. Candler, Mgr., Detroit: Schooner—Senator, Capt. Chas. Anderson.

Bigelow Bros., Chicago: Steamer—Madagascar, Capt. John Jenks, Engineer Chas. Nerreter.

McVittie, Alex., Detroit: Steamer—Senator, Capt. E. B. McQueen, Engineer Andrew Carter.

Green, John, Buffalo: Steamer—Lewiston, Capt. Daniel McKenzie, Engineer James Green.

Hurley, T., Detroit: Steamer—Majestic, Capt. M. G. McIntosh, Engineer T. F. O'Connor.

Danaher, J., Ludington, Mich.: Steamer—W. J. Carter, Capt. A. C. Wanwig, Engineer ———.

Adams, Tom, Detroit: Steamer—Tom Adams, Capt. D. Nicholson, Engineer Jas. Kelly.

Drieske & Co., Wm., Chicago: Schooner—Ralph Campbell, Capt. Peter Hansen.

Sylvester Bros., Toronto, Ont.: Schooner—St. Louis, Capt. Geo. Williamson.

Durand, Homer, Toledo, O.: Schooner—P. B. Locke, Capt. Homer Durand.

AIDS TO NAVIGATION ON LAKE ERIE.

Kingston, Ont., Feb. 26.—Capt. T. Donnelly of Kingston, chief inspector of the Canadian Lloyds, Capt. John Gaskin and other representatives of Canadian vessel interests, who joined Capt. Geo. P. McKay of the Lake Carriers' Association in requesting more aids to navigation from the Dominion officials at Ottawa a short time ago, are certainly doing all in their power to have the channels in what is known as Pelee passage, Lake Erie, more efficiently lighted during the coming season of navigation than they were in the past season. In a communication on this subject to Sir Louis Davies, minister of marine and fisheries, they say:

"Up to the close of navigation in 1899 a light-house existed on Point Pelee, which was burned early in the spring of the following season. Since then the only aid to navigation in this important channel has been a gas buoy placed upon Southeast shoal. The insufficiency of this light has been shown several times, when steamers have not only been unable to satisfactorily locate it, but have in some cases actually found this buoy. We understand that the department has decided to place a light-house on the middle ground inside the passage. We would respectfully submit that while it would be an advantage to have this light on the middle ground it is much more important that a light-house should be placed upon Southeast shoal, as this is the objective point of all vessels approaching this channel. In some ways if there were no light-house on this shoal and a light-house on the middle ground it might be almost a disadvantage to vessels approaching from the eastward, although if the light-house were placed on Southeast shoal as well no possible mistake or difficulty could arise. While we fully appreciate the advantage of having a light-house on the middle ground and the necessity of having this in operation as early as possible, we would respectfully suggest the absolute necessity of properly lighting Southeast shoal with a permanent and satisfactory light and fog whistle. It is unnecessary to point out that through this particular channel more tonnage passes than at any other point in Canadian waters, or, indeed, at any other one point in the world. The trade has grown so quietly, but so continuously, that this is not generally known, but we have no hesitation in asserting it as a fact that this is one of the most important points in the navigation of the world. As to the difficulties of the navigation you are no doubt conversant with the facts, as the shoals are fully laid down in the charts of your department, and we feel convinced that it is only necessary to draw your attention to the matter and ask you to give it your consideration to ensure the immediate removal of the difficulties which now exist."

CONFLICT OF NAVIGATION RULES ON THE GREAT LAKES.

At the last annual meeting of the Lake Carriers' Association in Detroit it was decided that Canadian vessel owners who are members of the association would be asked to co-operate in trying to secure changes in the rules that govern Canadian vessels within the jurisdiction of Canada so as to have them conform in several important particulars with the White law of the United States. Capt. Geo. P. McKay of Cleveland, who visited Ottawa for this purpose a short time ago, found the Canadian vessel owners quite willing to assist in trying to bring about uniformity in the rules. He was joined in this as well as other matters relating to the operation of lake vessels by W. J. White, K. C., by Capt. T. Donnelly, chief inspector for the Canadian Lloyds, and by Capt. John Gaskin, representing large Canadian vessel interests. The Review has just secured a copy of the communication on this subject submitted to the department of marine and fisheries. It is as follows:

To the Hon. Sir Louis Davies, Minister of Marine and Fisheries—Sir: On behalf of the Lake Carriers' Association, we are instructed to call your attention to the difficulties which have arisen in regard to the rules of the road which now prevail upon the great lakes. After careful consideration the government of the United States has adopted certain modifications in the rules which prevail upon the high seas, and these modifications (the White law) have been made applicable to all vessels navigating in American waters upon the great lakes. The rules which govern Canadian vessels within the territorial jurisdiction of Canada are contained in chapter 79 of the revised statutes. It has been found in practice that particularly during the periods when fog prevails great difficulty is experienced by navigators in exactly locating the boundary line. Cases have arisen in which accidents have happened very close to this line, and had the commander been following the rules of the nation outside of whose territorial jurisdiction he was, the courts would in all cases have decided adversely to the owners of his vessel.

We think there is no doubt that the matter is fully within the jurisdiction of the parliament of Canada, inasmuch as it was found necessary by the legislation we have referred to to make the international rules of the road applicable in Canadian waters. We, therefore, desire that legislation should be introduced amending the present rules in one or two important particulars, namely:

1. That section 2, sub-section 3, which is referred to as article 3, should be amended in such a way that in all cases only two lights should be displayed at the mast head instead of three, as now provided for. The rule in the United States on this score reads as follows: "A steam vessel having a tow other than a raft shall, in addition to the forward bright light, carry in a vertical line not less than 6 ft. above or below that light a second bright light of the same construction and character and fixed and carried in the same manner as the forward bright light. Such steamer shall also carry a small bright light abaft the funnel or after mast for the tow to steer by, but such light shall not be visible forward of the beam."

2. Article 15, sub-section "a" of the Canadian act, provides that a steam vessel having way upon her shall sound at intervals of not less than two minutes a prolonged blast. The American rule applicable in such cases is that a steam vessel under way, excepting only a steam vessel with raft in tow, shall sound at intervals of not more than one minute, three distinct blasts of her whistle. Under article 28 of the Canadian rules one short blast means "I am directing my course to starboard." It has been found in practice that those in control of the vessels have sometimes confused the fog signal under the British and Canadian rules with the signal under the American rules to pass to starboard. As has been pointed out above, if this mistake occur in Canadian waters the long blast would be held to be the proper signal simply for preventing accidents in fog, but if the accident should occur in American waters it would be a matter of proof as to the duration of the blast, a matter which would be almost impossible to satisfactorily establish.

The Lake Carriers' Association is composed not only of ship owners and those interested in the carrying trade from the United States, but also of Canadian ship owners and those who have large interests in the great lakes. It is unnecessary to call your attention to the great importance of securing for Canada as large a proportion as possible of the trade coming from American ports on these lakes and of encouraging in every way the bringing of the American boats to Canadian ports. We feel that we should mention this particularly in connection with the large expenditure which the government has made in improving our canal system and the works which are now being carried forward at Port Colborne. The interests of the two nations in matters of commerce are so closely allied that we feel confident that your government will do everything which can reasonably be asked to encourage that friendly intercourse which must be beneficial to the people of both countries.

We may add that this question has only become of importance lately when American ship owners have had their attention directed to Canadian ports of export, and the present conditions due to the enlargement of the canals and other improvements which have been brought about by your government lead us to hope that there will be a very great increase in this direction in the near future.

This communication is signed by the committee referred to in the opening paragraph.

STRIKE OF MARINE ENGINEERS ON THE LAKES.

It has been expected since the annual meeting of the national organization of marine engineers in Cleveland, a few weeks ago, that a strike of members of the association employed on vessels of the Lake Carriers' Association would occur before the opening of another season of navigation. Immediately following the meeting of the national organization, President Geo. Uhler of Philadelphia personally presented to officials of the Lake Carriers' Association a schedule of grades for engineers based upon tonnage of vessels, with wages named for each grade. The increase in wages over last year was not great, but the schedule provided for three engineers on large freighters and was so framed generally as to require considerable more help than in the past. A request was made that the communication be answered by Feb. 20. The vessel owners simply acknowledged receipt of the communication. President Uhler visited Cleveland during the present week, and upon pressing Mr. James Corrigan, one of the executive officers of the Lake Carriers', for an answer to the communication, was told that he (Mr. Corrigan) had no answer to give except that the vessel owners had not passed upon the request and he did not know when they would do so. Mr. Uhler then instructed engineers in different parts of the lakes who are members of the M. E. B. A. to quit work if they were engaged in any way and to take no part in the fitting out of Lake Carriers' vessels until the differences are settled. There is practically no work of an engineer kind being done as yet and the vessel owners seem entirely indifferent to the situation. The outlook from a lake freight standpoint is such that any condition tending to hold vessels in port is welcomed by the vessel owners, so that there is very little interest thus far in the action of the engineers. It is more than probable, however, that the situation will be quite different later on, as a protracted struggle seems inevitable.

The unions of seamen and firemen are taking a stand against the federation of employes proposed by the Lake Carriers' Association. Following is a copy of a circular which they have distributed all over the lakes:

"All firemen and seamen who sail on the great lakes for a livelihood are earnestly requested not to take a card or anything else connected with the vessel owners federation that is about to be established on the great lakes. This system of vessel owners federation was the cursed cause of disbanding organized labor in Great Britain. Union firemen and seamen, don't sign any federation papers or take a card, as it will be a detriment to the union cause!"

Capt. Wheeler Hancock, who died at his home in Detroit Saturday, aged sixty years, was well known and esteemed among vessel men of the lakes. His last command was the steamer Rhoda Emily.

"NAVAL LESSONS FROM AMERICA."

UNDER THIS CAPTION ONE OF THE LEADING TECHNICAL JOURNALS OF ENGLAND DISCUSSES THE LAST ANNUAL REPORT OF THE ENGINEER-IN-CHIEF OF OUR NAVY—FRANKNESS OF THE REPORT AND ADMIRAL MELVILLE'S INDEPENDENCE ARE MARVELED AT.

From Engineering, London.

The annual report of the chief of the United States bureau of steam engineering is a publication that British engineers may read with interest and regret—interest for the matter contained, regret that we have no like record. Our older methods of naval administration have traditions of secrecy which the public interest does not warrant.

The expenditure of the United States bureau, estimated for the fiscal year—ending June, 1902—is under half a million sterling ($2,256,762), of which about half is spent in labor. The total does not seem large, considering the position of importance the American fleet is now taking among navies of the world. Admiral Melville, the professional chief of the bureau, does not hesitate to point out the defects in administration with characteristic frankness. Again we say it is a pity our own engineer-in-chief has not the same power of making his voice heard. The report points out the danger of a failure in the supply of those young engineers who should provide the talent required for continuing the work of the department "in its most effectual spirit, and make the future record one of increasing progress." What that work is we gain some idea from the report.

There is "a flood of detailed drawings, amounting to several thousands during the year, constantly coming from the contractors, in which are submitted the expansion of the various parts of the general design of the machinery of ships under construction." These have all to be approved by the bureau. For a single battleship—the Kearsarge—there were 595 separate drawings of the machinery. Many of these were submitted more than once; and, indeed, the 595 drawings only represented the approved plans, and not those which were discarded or needed alteration. All these had to be carefully studied by the technical members of the staff; and, as on their decision rests the success of the vessel, no hasty or perfunctory discharge of the duty can be permitted. Admiral Melville, like all good chiefs, is proud of his staff. "I can assure you," he says, in addressing the secretary of the navy, "that the wonderful immunity from casualty in the engineering department in the vessels of the regular navy is, in a great degree, the result of the extraordinary ability exercised in the designing rooms of the bureau." Of this manifestation he selects one instance, not without interest to us at the present time. "Some years ago," he says, "the department was urged with no little pressure to adopt the Belleville water tube boiler as a standard for the new ships. The bureau opposed the innovation wholly upon a close examination of the designs, criticising the very defective features which in later years have made conspicuous the comparative inefficiency of this type over the purely straight tube non-screw-joint type for which I have given continuous and urgent preference."

No doubt the department over which Admiral Melville presides is "to be congratulated," as he claims, "upon the conservative approval it has given to the change in the boilers of naval ships." For America that is well enough, and we have reason to believe that at our admiralty, also, difficulties in working the Belleville boiler were foreseen. Unfortunately the passages of the report will be seized upon by those who delight to vilify our own admiralty engineers, and they will be quoted, or misquoted, after the manner of such disputants. It would be well, however, for the critical British public to remember that the royal navy stands on a different footing from that of other navies. What they can afford we cannot. To the United States a powerful navy is more or less an ornament; to Great Britain it is a necessity of existence. The United States bureau of steam engineering can afford to wait, to risk their ships being, for a time, a little slower, or in some other way a little less efficient. With her vast self-contained territory the United States might be cut off from the rest of the world—not, of course, without suffering but without fatal disaster. Her distance from the other great military powers, together with the spirit and patriotism of her citizens, renders invasion impossible. So it was that Admiral Melville and his colleagues could continue to use shell boilers until experience had matured in other countries, and by that experience they have profited. No less credit is due to the United States department for the sagacity displayed. As the report says: "Instead of having been encumbered during the last war with ships powered with a type of boiler necessitating a specially trained force even for its safe operation, the most effective vessels had either retained the Scotch boiler or possessed the simple straight tube Babcock & Wilcox boiler, and remained free from any real danger of becoming hors de combat by reason of a lack of a completely experienced fire room management, or the sudden failure of delicate and intricate special apparatus connected with the steam generators."

All naval engineers will agree with the report in condemning "delicate and intricate special apparatus" whenever it can be avoided; and screwed joints are doubtless a source of danger. When the admiralty had to adopt the water tube boilers they had to take what offered. They found the Belleville boiler installed in France, and had no time to make experiments or wait upon invention. We have profited since, as the rest of the world has, by our experience, and we may hope that our own navy will not lag behind the fleets of other powers in adopting what is most to be desired in the future. The danger of the waiting policy—the "conservative approval," of which Admiral Melville speaks—is so insidious an argument that against it we can hardly guard ourselves too strongly. It is so specious. "Wait a little, a couple of years or so, and we shall see something still better follow this better thing; and so we may save ourselves many thousands of pounds." It is, indeed, an argument that has too often been listened to in England. We used to delay the completion of our warships for just such a reason; and in the meantime left the country so much more open to attack. We have used the same argument in regard to electrical matters. "Let us wait and see what the Americans do; let them pay for the experience." This has been said more than once in public; and now we see American engineers taking enormous fees—which no one should grudge—for American advice, and American electrical machinery coming into the country in a way never before known; and this because America had the first experience. No doubt this latter state of affairs was largely due to foolish legislation, but it well illustrates the danger of getting behind, either in military or industrial warfare. If finality could be seen ahead—say in a year or two—there might be something to say in favor of waiting, though even then it would be a dangerous policy for us. But there is no finality in engineering; and the water tube boiler placed in the American ships today will be outclassed long before the vessels have run their course. In the meantime Admiral Melville has been remarkably successful with his ships. He can afford to wait; we cannot.

Another section of the American report which has an interest for British naval reformers comes under the heading of "Consolidation of Bureaus." A demand has been put forward in the United States, and the same idea has been mooted in England, that the professional staff of the navy office should be combined in one department to be known as the "bureau of ships." Admiral Melville has had many years' experience of naval administration, and it will be profitable to hear his opinions. It may be said at once that he is opposed to such a scheme of consolidation. He points out that in every large ship building establishment there exists a more complete system of separation of special branches than in the American navy. Nominally there is a head, but no pretence is ever made by that head of possessing expert knowledge regarding all branches. Frequently, he says, the head is not a technical expert at all, but simply a good general manager. Every tendency is to increase specialization in work. The secretary of the United States navy recommended to congress in his last annual report that the bureaus of repair, steam engineering and equipment, should be amalgamated, and Admiral Melville does not hesitate to differ from the opinion of his political chief. Remembering that the report under consideration, in which these views are expressed, is printed and circulated widely throughout the states, such independence would be looked on in this country as a species of mutiny; and certainly no English engineer-in-chief could publicly say to the first lord of the admiralty what Admiral Melville says to the secretary of the navy, without first resigning his position. In any case such a course would here be considered a public scandal, and most people would declare the business of the country, to say nothing of the discipline of the navy, could not go on under such conditions. We do not find, however, any loosening of the roots of society following this procedure in America. The secretary of the navy—the equivalent to our first lord of the admiralty—finds it possible to carry on his duties, even though every one is not thought to be in agreement with his policy; and Admiral Melville, having registered his opinion, can carry out his duties, even if they sometimes clash with his own convictions. That appears to us an honest and sensible course of procedure.

"Your impression that the work of the three bureaus," the chief engineer-in-chief says to the naval secretary, "is an integral work is certainly not gained by a close examination of the character of their separate specialities." The report goes on to point out that the navy department is in itself a "bureau of ships," the head of which is the secretary of the navy, who makes no pretence of having expert knowledge in any branch of the work. The impossibility of one man possessing the combined education and ability to be an expert in all branches is pointed out to the secretary. "A life-long study of any one mechanical art is needed to secure eminence and utmost proficiency in it." In other words, the expert engineer cannot hope to be an accomplished naval architect, nor can the trained naval architect be a proficient engineer. The single official in charge of the dual department would therefore be "but a second assistant secretary of the navy." The "combination would not be real, and the only effect would be to humiliate the chiefs of the bureaus by destroying their nominal integrity, and the pride they feel in preserving it." Later on the report says: "Ships of war are of such construction that it would not be safe to trust their design to any one man, with the prospect of his carrying out thereon his particular fads and experiments."

In our own navy there is very little danger from the course referred to in the last sentence. The constructive and engineering departments at the admiralty have for their chief the controller of the navy, a naval officer who is now one of the board of admiralty. The design of a warship, so far as military purposes are concerned, is in the hands of naval officers. The professional staff, the constructors and engineers, are responsible to the board, through the controller, for technical matters within their respective provinces. Whether it would be possible to find a man capable of exercising intelligent and effective supervision over the whole construction of the ship is a matter upon which only conjecture can be offered. To us it seems that the chief danger that arises in connection with our system of admiralty management comes from the absence of real responsibility on the part of any one official, naval or civil. The controller is in office for a short time only. He is unacquainted with matters in which he rules; he is not, for some time at any rate, even acquainted with the routine of his office, and he is, therefore, in the hands of his subordinates. The whole machinery of admiralty and dock yard management is old-fashioned and out of date, and such success as is achieved in these times of naval peace, that have lasted nearly for a century, is due to the able men who have served the country, and in spite of the system.

Another matter to which Admiral Melville refers at some length, and which is also of unusual interest to us, is the position of naval officers. It will be remembered that in the United States navy the line and engineer officers have been amalgamated by an act of congress. The scheme has not worked to the expectation of those who were mainly instrumental in bringing it forward. "Another year of experience under the provisions of the personnel bill," says the report, "finds the status of steam engineering interests in the navy even less fully protected, and the number and condition of the force for their control even less satisfactory than when I made my last annual report." The truth appears to be that the arrangement does not, as the report puts it, "properly materialize." Either the scheme was a mistake, or the proper course has not been taken to carry out its intent; and though Admiral Melville is free to acknowledge that the events of the past year have brought only discouragement, he is convinced that the result is due to the latter alternative. "The cause of discouragement," he says, "is not in the scheme itself, but in a lack of full appreciation, on the part of the department, of the urgency of the need for haste, not only in providing the fullest opportunity for the ac-

quirement of practical engineering knowledge on the part of the younger officers of the former line, but in enforcing their embracement of this opportunity."

It is satisfactory to learn that it is the department that is to blame, and not the officers. A scheme which amalgamated the line (or, as we should say, the executive) and the engineering branches, would naturally lead to a dearth in the numbers of the latter if any of them were diverted to deck duties; for it takes time to make an engineer. As the number of engineers was altogether beneath the needs of the service before, it will only be by younger men coming forward that the ranks will be filled. Having abolished the purely and exclusively engineering branch, it seems to us that it is evidently the duty of the governing authorities to see that officers coming forward are instructed as engineers, otherwise the navy must suffer. Doubtless men will specialize after a time, being sorted out by a process of selection, and if there is too great a disposition to prefer the bridge to the engine room it would seem a wise policy to offer greater inducements, in the shape of more rapid promotion to higher rank, and, therefore, more liberal pay, with perhaps earlier retirement, to those who embrace a less attractive side of the profession.

In the royal navy no effort has been made to grapple with this question; which is one of the highest importance. Within the last few weeks an animated discussion on "The Training of Naval Officers" has been going on in the Times, in which it would almost seem that half the admirals of the fleet have been taking part. To read the letters one would think we were back in the beginning of the last century, before ever a steam engine had been placed in a British man-o'-war. Whether mathematics, or Roman law, or French, or German, should be most taught has raised all manner of opinions; but whether a naval officer should know the difference between an engine and a boiler seems to be a matter of profound indifference. It is an indifference for which we should pay dearly, if ever we were to engage a hostile fleet provided with officers more intelligently trained, on anything like equal terms.

HAMBURG-AMERICAN LINE ENTERPRISE.

The Hamburg correspondent of Syren & Shipping writes: "The Hamburg-American line has just issued a plan of operations for the ensuing year, from which we note that the company, during the last nine months, has increased its tonnage by no less than 130,000 tons register. The Hamburg-American line owns at present ninety-three ocean-going steamers, with 461,648 tons register, and 102 river steamers, etc., with 20,657 tons register; while there are at present being built for the company nineteen ocean steamers, with 121,300 tons, and twenty-seven river steamers, etc., with 7,462 tons, all of which—or at least the bulk of which—will be ready and taken over before the end of the year. Consequently the Hamburg-American line controls 611,067 tons register, as compared with 378,770 tons register of the British India Steam Navigation Co., and thus further establishes the claim to being the largest steamship company in the world. Director General Ballin being away in far off China on a combined trip of pleasure and business, the premier charge of the huge concern has been left in the able hands of Director Guido Wolff, who has done so much to make the company what it is. The fact of their having attained the present position as the largest company on the face of the earth will, however, not prevent the four directors from 'going one better,' and we have no doubt that they will meet any challenge to the blue ribbon held by the Deutschland, or any challenger to their title as champions of the mercantile marine of all seafaring nations with redoubled energy, foresight and enterprise. To cater for passengers they bought large hotels in Paris during the exhibition; they constructed special pleasure yachts, like the Prinzessin Victoria Luise; and they built a magnificent new office overlooking the Lake Alster. There is 'go' and life in whatever they set their hands on, and they rely more upon their own resources than upon state subsidies."

BOILERS FOR MORE THAN TWO MILLION HORSE POWER.

Since the first of the year the British admiralty has given notice to Delaunay, Belleville & Co. of St. Denis (Seine), France, of the following vessels to be fitted with Belleville steam generators of the new economizer type: Cruiser Encounter, 12,500 I.H.P.; cruiser Cornwall, 22,000 I.H.P.; battleship Queen, 15,000 I.H.P.; battleship Prince of Wales, 15,000 I.H.P. These orders make a total of sixty-five British war ships fitted with Belleville water tube boilers, representing altogether 1,046,400 H. P. In a letter to the Review, Delaunay, Belleville & Co. say: "The preference which the British admiralty continues to show to our boilers is the best answer to be given to attacks to which the Belleville water tube steam generators have been subjected in England."

The total horse power of sea-going ships fitted or to be fitted with Belleville boilers is as follows:

	No. of ships.	Total H. P.
French navy	40	371,320
The Messageries Maritimes Co.	14	87,600
French Western Railway Co.	7	17,900
English navy	65	1,046,400
Russian navy	31	251,300
Japanese navy	10	122,700
Austrian navy	5	56,700
Chilian navy	4	26,500
Argentine navy	1	13,000
Italian navy	2	32,500
Spanish navy	1	11,000
	180	2,036,920

In addition to the above ocean steamships, Belleville boilers have been fitted to a large extent on small steam boats and launches, tugs, fisheries, guard boats, steam yachts, dredgers, etc.; also a great number have been supplied to the French and foreign navies for auxiliary services.

The house has yielded to the senate on the naval bill and decided not to further insist upon the construction of any more battleships and cruisers. The bill, as it passed the house, provided for two battleships and two cruisers, but the senate struck out that provision and substituted the construction of three Holland submarine boats.

ENGLISH VIEW OF THE STEEL COMBINATION.

The English technical press is thoroughly alive to the significance of the new steel combination. Engineering, a recognized authority on the other side, discusses it in the following manner:

"There is no reason to doubt the substantial accuracy of the statements sent over from New York during the past few days concerning the Carnegie company. The Morgan syndicate has acquired a dominant control in the company by buying Mr. Carnegie's interests outright; and it may be accepted as accurate that an arrangement has been practically consummated, whereby the Carnegie Steel, Federal Steel, National Steel, American Steel & Wire, and several other companies, are to be combined and operated under the one management. Mr. Pierpont Morgan is credited with having moved in this matter with the beneficent intention of establishing peace, and he has succeeded—and will, no doubt, reap a very substantial reward. The Carnegie company, it may be pointed out, has hitherto refused point-blank to become a party to any combination of steel manufacturers, and the dream of a gigantic steel trust to control the home markets, and to make a concentrated attack on the foreign outlets affected by Great Britain, has perforce remained unfulfilled. Obviously, no combination could be said to be of much account which did not include the most important undertaking of its class in all the country. So far from acquiescing in the trust proposals, the Pittsburg firm has been rather inclined to defy the other manufacturers, and some of its developments have been dangerous to them. For instance, it was announced towards the end of the year that the company had decided upon the erection of a pipe and tube factory at Conneaut, O., which would be the largest in the world, and which would possess all possible advantages for cheap manufacture in the tube line. There was no doubt as to the ability of the concern to make itself obnoxious, not only to the older tube company, but to the others. It is not exactly clear whether the Carnegie interest meant business by all their recent aggressiveness, or whether it was designed to bring the others to reason in order that the eminent and highly successful creator of the business might retire and lead that 'dignified and unselfish' old age of which he has spoken so frequently. The fact that Mr. Morgan is the leading spirit of the National Tube Co. and that this company was to have been the immediate object of the Carnegie first attack, seem to have had a good deal to do with the final arrangement. Now that all the producers have amalgamated, one feels inclined to be sorry for the mere American consumer, who is left without a friend.

"For the United Kingdom this development is of very considerable interest, not only because of its magnitude, but because of the effect which it is likely to have on our home and foreign trade. With the American domestic market quite under control, the combination will be the better able to spread itself abroad. In spite of the improvements in processes of manufacture, of which we have heard so much of late, we fail to see how American manufacturers could hope to compete on a large scale with English, Belgian and German producers in Europe and the East if they were solicitous to obtain a fair profit on such business. But there is the 'law of surplus,' of which Mr. Carnegie himself has boasted—that law which consists in selling at, or below, cost abroad when necessary, and charging as much as you can squeeze out of the home consumer, who cannot buy abroad because of the high import tariff. In this way you get a good average profit on the whole of your output, and by letting the foreigner have all that you cannot place at home, you prevent stocks from accumulating and the market from weakening. An inevitable outcome—at least as regards the American market—will be a centralization of steel control almost as complete as has been effected in petroleum oil. So long as the supply of a commodity was subject to economic forces, and its price was fixed by the action of buyers and sellers upon each other in the open market, a man could afford to rely upon his own judgment or simply to take his chances. But if the output is to be regulated by two or three men, or if the supply can be held till it suits half-a-dozen men acting in association with each other to put it on the market, the speculator has no chance at all; he is playing with the dealer, who has given himeslf all the trumps. There is practically no speculation in oil. Speculation in copper has nearly ceased, for the production is controlled by a few great companies acting together. There is scarcely any speculative trading in lead in the states—the metal is controlled by a trust. The business of the metal exchange in New York has dwindled to very small proportions, and there is only one opinion as to the reason for it, and that is that the combinations are controlling the commodities. Manifestly the same thing is being done in steel, and it is to be added, as an instance of the way in which the consolidations are strengthening their position, that the Lake Superior iron ore mines are practically all under their control, and this is a development which tells still more against the ever-decreasing number of independent manufacturers. It does not follow that the trust will pursue its advantage in the home market to the last cent, because that would be to restrain enterprise; but short of this—and it probably knows where to stop—it will have matters pretty much its own way, so long as the cost of goods is kept just under that of foreign commodities laid down in America—that is, with freights, import duty, and handling charges thrown in."

NO DRY DOCK IN NEW YORK HARBOR.

The senate committee on commerce has given such a black eye to the proposition of New York capitalists to construct a $3,000,000 dry dock in the harbor of New York that Senator Depew has withdrawn it. The proposition was before the committee in the shape of a proposed amendment to the sundry civil appropriation bill. It provides for paying $100,000 a year for fifteen years to capitalists who should build a stone dock 1,000 ft. long and 33 ft. deep, with steel gates, the government to be reimbursed by a provision that United States war vessels should perpetually have the first right to the use of the dock and that the government could take possession of the dock at any time on payment to the company of an equitable sum of money. E. D. Cragin of the Cragin-Eyre syndicate and Amasa Thornton appeared before the committee as attorneys for the capitalists who proposed to build the dock, but there was such a strong feeling in the committee, which found voice in the statement of Senator McMillan against paying what might naturally be regarded as a subsidy for dry dock building, that no serious consideration was given to the proposition, and Senator Depew, a member of the committee, said he would not press it.

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To All Old Sailing Masters on the Great Lakes.

The Marine Review is desirous of obtaining the experiences of old sailing masters on the lakes and the histories of the old vessels which they sailed, together with photographs or pictures of them and their craft. These old sailing masters and their vessels are a part of the history of the great lakes which is fast becoming obliterated by the revolution in lake transportation. This history is of a perishable nature because it exists largely in the memories of men who have spent the greater part of their lives on the lakes. If it is not preserved now it never will be preserved. The Marine Review therefore begs old captains and mates and vessel owners to write a brief account of their lives, their experiences on the lakes and the histories of the vessels upon which they sailed. The Review will both publish and pay for the matter. Never mind spelling, punctuation and diction; the Review will furnish those; just relate the facts. The Review hopes that every old sailing master will take this as an appeal to him personally and jot down during his winter evenings a rough sketch of his life. For instance, but little is known about Lake Superior navigation prior to the opening of the Sault Ste. Marie canal. Who knows about it? Has anyone any pictures of the vessels afloat on Lake Superior at that time. If so, send them to the Review to be photographed and they will be promptly returned in good condition. By the same token, does anyone know of the first steamboat line that ran between Detroit and the Sault?

Some little while ago congress authorized the promotion of six gunners to the rank of ensign, which corresponds in the navy to that of second lieutenant in the army. This praiseworthy legislation on the part of congress to open the path of progress to the enlisted men has stirred up quite a commotion in the navy department. The first to take advantage of it was Charles Morgan, a gunner stationed at Newport. Having served on the flagship New York, he appealed to Admiral Sampson to be recommended for examination for promotion. Morgan is a most exemplary young man and the admiral took pleasure in forwarding his recommendation to the secretary of the navy. However, in doing so he pronounced sentiments distinctly unamerican and decidedly at variance with Napoleon's motto, "every private carries a marshal's baton in his knapsack." After endorsing the application of Morgan, Admiral Sampson wrote as follows:

"It is earnestly hoped that the secretary of the navy will not find it necessary to take advantage of the authority which is to be granted him to appoint a certain number of warrant officers to the grade of ensign. While it is true that these men are selected from a very large class of men of unusual ability, which distinguishes them as perhaps the professional equals of their officers, as far as technical education stands, it is also true that they are recruited from a class of men who have not had the social advantages that are a requisite for a commissioned officer. It is submitted that in time of peace the navy's function consists to a certain extent of representing the country abroad and it is important that the navy's representatives should be at least men of refinement. While there are perhaps a certain few among the warrant officers who could fulfill this requirement, I am of the opinion that the vast majority of them could not. Once they are commissioned they will have the same social standing as the other officers and no distinction properly could be made in extending general invitations. The consequences that would arise from their acceptance might not redound to the credit of the navy or the country which the navy represents. I do not mean to detract from the sterling worth of the warrant officers of the navy. I merely mean to suggest to the department that, unfortunately for them, they have been deprived of certain natural advantages, and in consequence their proper place is that of leading men among the crew and not as representatives of the country in the ward room and steerage."

Admiral Sampson must not think that gentlemen are turned out at Annapolis exclusively. True courtesy is an inherent quality and is not bestowed by universities and academies. The greatest of natural gentlemen might not be able to spell his name correctly; yet that would not mar the quality of gentleness which is inborn. Nor is ability of academic origin. Ability is native; the university merely disciplines it. The world is full of men who educated themselves as they went along through life, assimilating from day to day the knowledge which they needed for the day's work. The most striking example of this power is that furnished by William Pitt, the younger, who was a member of parliament at twenty-one and prime minister of England at twenty-five. Compared to Edmund Burke and others with whom he was contemporary, his education was of the scantiest kind, yet had he died at thirty-one his life would have been the most signally triumphant of any man who had ever lived. The Review is sorry that Sampson should have been guilty of such narrow-mindedness.

As a factor in steel making Andrew Carnegie is no more. This means that the greatest of steel makers has retired to enjoy his rest and to pursue a dignified and peaceful old age. Once upon a time he said that the man who died rich died disgraced and announced his determination to rid himself of his riches before his death. This, of course, was hyperbole, but it was an emphatic way of announcing a purpose to distribute his wealth in endowments while living. Andrew Carnegie could not die a poor man if he tried. For while he has a penchant for giving away libraries, he is by no means in the business of giving away steel mills. He has parted with his property in consideration of a bonded investment which yields him an income of $30,000 a day, including Sundays. It's a troublesome thing to actually spend $30,000 a day.

During the civil war Andrew Carnegie was a telegraph operator. That's not so very long ago. All his vast wealth has been created since. In enriching himself he has enriched his associates. The men whom he made managers are immensely wealthy. There's one young man in the company, scarcely forty years old, whose initial investment in the concern was not one cent and whose holdings today, based upon the valuation placed upon Carnegie's, aggregates $50,000,000. He has shared in the profits and his wealth has grown with the company's earnings. Andrew Carnegie has been a daring manufacturer. He has never hesitated to go to the utmost expense to replace old machinery with new. Indeed, his course has been in this respect ruthless. But it has paid. No man has taught the manufacturing world greater economic truths than Carnegie; the career of no man, for the few remaining years that are left to him, will be watched with greater interest.

CONSUMPTION OF PIG IRON DURING 1900.

Mr. James M. Swank contributes the following article upon the consumption of pig iron during 1899 and 1900 to the Bulletin of the American Steel & Iron Association:

At the time our pig iron statistics for 1900 were published in the Bulletin lack of time and space prevented us from presenting a table showing our approximate consumption of pig iron in that year. This we now do, giving also for comparison the figures for 1899. Our consumption of pig iron in the two years mentioned is approximately shown by adding the production and imports and stocks of unsold pig iron at the beginning of each year and subtracting from the total thus obtained the exports and unsold stocks at the close of each year, the comparatively small quantity of foreign pig iron held in bonded warehouses at the close of each year not being considered. In all our calculations spiegeleisen and ferromanganese are invariably treated as pig iron. Warrant stocks are included in unsold stocks.

Pig iron—Gross tons.	1899	1900
Domestic production	13,620,703	13,789,242
Imported	40,393	52,565
Stocks unsold, Jan. 1	415,333	68,309
Total supply	14,076,429	13,910,116
Deduct stocks Dec. 31	68,309	446,020
Also exports	228,678	286,815
Approximate consumption	13,779,442	13,177,281
Shrinkage in consumption in 1900 as compared with 1899		602,161

The above figures will surprise some of our readers who have supposed that, because we made more pig iron in 1900 than in the boom year 1899, we therefore consumed more pig iron in 1900 than in 1899. The figures tell a different story. In this connection we call attention to the statistics of our exports of iron and steel in 1899 and 1900, which were printed in our last Bulletin. They showed that our total exports of iron and steel for which weights were obtainable amounted in 1899 to 942,659 tons and in 1900 to 1,154,504 tons, an increase in 1900 over 1899 of 211,845 tons, which increase represents at least 300,000 tons of pig iron. If we add this 300,000 tons to the 602,161 tons at the foot of the above table we have a decreased consumption of pig iron in 1900 as compared with 1899, for strictly home use, of about 900,000 tons. The export figures we have given do not include our exports of locomotives, car wheels, machinery, etc., the weight of which is not given, but our exports of nearly all of which articles increased in 1900 over 1899. The present outlook is that, in consequence of the depressed condition and lower prices of iron and steel in Great Britain and Germany, our exports of many iron and steel products during the present year will fall below the figures of last year, and may even fall below those of 1899.

Our readers will draw their own conclusions from the above facts, and one of the conclusions that they will surely reach is that a prediction by a correspondent of the American Manufacturer of recent date, that "we shall use at home in 1901 very close to 15,000,000 tons of pig iron," must be justified by an increased foreign demand, if at all.

NOTES FROM LAKE SHIP YARDS.

As the ship yards of the great lakes are employed to full capacity in building sixty-one ships, valued at more than twelve millions, and all but six of them steel, there is little in the way of new orders—no orders, of course, for delivery during the present year, as it would be impossible to get out in 1900 a single vessel other than those under construction. But for delivery in the spring of 1901 there is still an occasional new order. Within a few days the Jenks Ship Building Co. of Port Huron has closed a contract with representatives of the Minch estate of Cleveland for a steel freighter that is to carry about 6,500 gross tons, and which may possibly be out late in the coming season. The steamer is to be managed independent of the Minch and Nicholas transit companies, in which the Minch family is largely interested. It will be a duplicate of the steamer Capt. Thomas Wilson, built a short time ago at the same yard—420 ft. keel, 440 ft. over all, 50 ft. beam and 28 ft. hold. The engine is to be a triple expansion, with cylinders of 23, 38 and 63 in. diameter and 40 in. stroke. Steam is to be furnished by three Scotch type 12x12 ft. boilers.

At Buffalo the steamer Bulgaria is receiving a new apron, stem, bows, rail, pilot house, part of new main deck, two sets of hatch coamings, hatch covers and nine plank in topsides aft; the steamer City of Venice 600 ft. of rail, crown steel arches and some plank in top sides; the steamer John F. Eddy new keel and garboards; the steamer Ramapo two keel plates aft and bow plates; the steamer George Spencer part new keel and some new plank. General repair work has been done on the steamer F. L. Vance.

GREAT LAKES TOWING CO.

Directors of the Great Lakes Towing Co., which controls nearly all the harbor tugs of the great lakes, did not elect officers at the annual meeting in New Jersey several days ago, but finished their work at a meeting in Cleveland Wednesday. It is understood that as regards certain matters of policy in the management of affairs of the company there was quite a warm discussion at the directors' meeting, b t it was not of a kind that need be made public. All the old officers and members of the executive committee were reelected. Mr. W. E. Fitzgerald was made a vice-president and therefore a member of the executive committee. Officers of the company and members of the executive committee are:

President and treasurer, Mr. T. F. Newman, Cleveland; vice president, Capt. James Davidson, West Bay City; second vice president, Capt. A. B. Wolvin, Duluth; third vice president, Mr. Edward Smith, Buffalo; fourth vice president, W. E. Fitzgerald, Milwaukee; general manager, Capt. W. A. Collier, Cleveland; secretary, Mr. M. H. Wardwell, Cleveland. Executive committee—Gen. G. A. Garretson, chairman, Cleveland; Capt. James Davidson, West Bay City; Capt. A. B. Wolvin, Duluth; Mr. L. M. Bowers, Mr. C. E. Grover, Mr. H. G. Dalton, Mr. T. F. Newman, Cleveland; W. E. Fitzgerald, Milwaukee. General counsel, Mr. James H. Hoyt, Mr. Harvey D. Goulder, Cleveland.

AROUND THE GREAT LAKES.

Secretary C. H. Keep and Treasurer Geo. P. McKay of the Lake Carriers' Association are in Washington mainly for the purpose of trying to secure in the sundry civil appropriation bill sufficient funds to care for lights that are now maintained by the Association. They are, of course, also looking after other matters of legislation.

The United States light-house inspector at Buffalo asks for bids before March 9 for the maintenance of buoys in St. Lawrence river and Lake Ontario and Niagara river until June 30, 1902. Proposals are also wanted as follows: For the year ending June 30, 1902, for provisions and fuel for vessels and stations in the fourth district, Pennsylvania; the same for the second district at Boston, and the tenth district at Buffalo.

Nothing has been done as yet in hull insurance for the coming season, although the Buffalo and Chicago agents have in some cases been visiting the vessel owners within the past few days. They say they are quite sure that notwithstanding the satisfactory outcome of the past two seasons from an insurance standpoint, the English interests will hold to about the same rates and same conditions of policy for another season and that this is also true of the American companies.

Publishers of the Iron Trade Review of Cleveland announce that on March 1 the paper becomes the property of the Iron & Steel Press Co. The same company has also purchased The Foundry of Detroit, the well-known monthly publication which occupies a unique position in relation to the foundry industry. Both journals will have their publication office in the Rose building, Cleveland, and will be directly represented also through editorial and business offices in Pittsburg, Chicago, Philadelphia and Detroit. More power to Messrs. Gardner and Findley. For some time past they have been publishing the most reliable of all the trade journals in America of an iron and steel kind.

Even the vessel men of the lakes who are well acquainted with Mr. J. C. Gilchrist cannot realize that he is acting entirely on his own account in the matter of buying up all the best of the wooden vessels of the lakes, especially as he goes on making new purchases every few days, notwithstanding the unsatisfactory freight outlook, at least as far as the next season is concerned. It is true, however, that Mr. Gilchrist has no great money interest and no special shipping interest back of him. He simply figures that no more vessels of the kind he is buying will be built and that he will eventually find profitable business for them, especially in the coal trade. A few days ago he added the wooden steamer George F. Williams to his fleet, purchasing the vessel from H. A. Hawgood of Cleveland. The Williams was built by F. W. Wheeler at Bay City in 1889 and carries about 3,000 tons of ore.

F. H. Clergue of Sault water power fame is certainly getting into a multiplicity of enterprises in Canada. A Montreal dispatch says he is planning to take over the entire undertaking of the Conners elevator syndicate and conduct the elevators and warehouses at Montreal which the syndicate has failed to provide. This is an undertaking involving large terminal facilities for the accommodation at Montreal of an extensive business which the Canadian canals are expected to give to Montreal. Mr. Conners and his associates have been a long time trying to finance the scheme. They say they are still at work and know nothing of Clergue in the matter. Clergue has wonderful influence with the dominion government officials and their confidence in him would very probably result in concessions that have not been given to Conners and his associates. Mr. Clergue is also engaged in establishing a marine and fire insurance company in Canada to be known as the St. Lawrence Lloyds Co. This is an outcome of difficulties encountered in getting insurance for vessels navigating the lower St. Lawrence. In this enterprise the names appearing are those of the Douglasses and others of Philadelphia who are associated with Mr. Clergue in the water power projects at Sault Ste. Marie. The capital of the insurance company is to be $5,000,000.

ANOTHER DEGREE FOR ADMIRAL MELVILLE.

The University of Pennsylvania a few days ago conferred upon Rear Admiral George Wallace Melville, chief of the bureau of engineering, the title of doctor of science.

George Melville was born in New York city on Jan. 10, 1841, of Scotch parents. Almost his entire life has been spent in the public service. He received a public school education and early showed a leaning toward engineering, entering, before he was nineteen, the engineering works of James Binns of East Brooklyn and acquiring a practical knowledge that stood him in good stead in later years. When not quite twenty-one years old, on July 29, 1861, he entered the navy as an officer of the engineer corps, and saw much active service. He was attached to the Dakotah when Farragut made his brilliant passage up the Mississippi river. Then young Melville joined the side-wheeler Santiago de Cuba, and latterly the Wachusett, being on the last named vessel when she captured the Florida, the confederate cruiser, in the harbor of Bahia, Brazil. Then he was on torpedo boat No. 6, when Porter took Fort Fisher, and when he joined the gunboat Maumee in the James river that vessel cut and rammed her way to Richmond on the day of that city's evacuation. When the war had ended Melville was ordered to the Tacony and with her served in the Mexican gulf during the French occupation and evacuation of Mexico. Later he joined the gunboat Penobscot, then cruised to Brazil in the flagship Lancaster, then to the Arctic in the steamer Tigress, then to China and Japan in the flagship Tennessee, again to the Arctic in the steamer Jeannette, and yet again in the Thetis for the relief of the Greeley expedition. The latter duty, with a short term on the Atlanta, closed his service afloat, which, after the war, was interspersed with brief details to the various navy yards.

An incident that shows the unflagging disposition of Melville and his grim persistency is related in connection with his search for De Long and Ambler, members of the ill-fated Jeannette Polar expedition. Melville, with arctic winter coming on, left Bulun, one of far north settlements, with two natives, two dog teams and five days food. He was gone twenty-three days and covered more than 1,000 miles before he returned to Bulun. Melville early became disabled. Inured to the cold as they were, his men flagged often in their march, but by entreaty, by argument, by intimidation with the sight and sound of fire arms, the half frozen, helpless but dauntless leader, kept them moving. Once they mutinied outright, saying: "We have no food. We cannot go. We shall die!"

The only answer was: "I will go on. We shall eat the dogs first, and after that, I will, if necessary, eat you Yakutsk, but I will go on."

Rear Admiral Melville has been honored with the following degrees and orders: Gold medallist, by act of congress, for heroic service in the Arctic; honorary member of the Royal Swedish Society of Anthropology and Geography; Institution of Naval Architects, Great Britain; Franklin Institute, Philadelphia; American Society of Civil Engineers; American Society of Naval Engineers; vice president American Society of Mechanical Engineers; vice president Society of Naval Architects and Marine Engineers of the United States; member of the military order of the Loyal Legion of the United States; of the General Council of the General Commandery, Naval Order of the United States; Grand Army of the Republic; National Geographical Society. Washington, D. C.; National Academy of Sciences, Washington, D. C.; Philadelphia Academy of Sciences; LL. D., from Georgetown University; master of science, from Columbia University of New York; doctor of engineering, from Stevens Institute of Technology, Hoboken, N. J.

SECRETARY LONG TO ADMIRAL HICHBORN.

Secretary Long has written the following commendatory letter to Rear Admiral Hichborn upon the occasion of the latter's retirement as chief constructor of the navy:

"My Dear Admiral: I cannot let you retire from the department with which you have been connected so long and so efficiently, without a parting word of both regret and of benediction. Your official service has been such, and our personal relations have been so agreeable that I write at once as a friend and fellow official. You have been in the construction bureau of the department during the transition time from the old navy to the new, and during a large part of that period have been the head of the bureau of construction and repair. This term of service covers the remarkable increase of our navy in which you have borne so conspicuous a part and which, in place of the old and now obsolete types, has substituted the torpedo boat, the gunboat, the protected cruiser and battleship. These stood the test of the recent war with Spain and put our navy in the forefront. I never lose the opportunity of testifying that the credit of all this is due not only to the men who fought the ships, but the chiefs of bureaus who constructed, equipped and armed them; and as one of these chiefs you, too, have a share in the victories of Manila and Santiago. You retire from the navy in the fullness of its glory, and I congratulate you upon the fact that, although you have reached the age of retirement, you do so in full vigor and health of body and mind, and with the prospect before you of many years yet of useful and happy life. With every good wish and with kindest regards, I am,

Yours truly,

Washington, D. C., Feb. 25, 1901. JOHN D. LONG.

The Atlantic Works, Incorporated, of Philadelphia last week shipped to the Townsend & Downey Ship Building & Repair Co. of Shooters' Island, N. Y., one of their heavy swing saw machines and also a universal saw table.

CONSTRUCTION OF TORPEDO BOATS AND DESTROYERS.

BY GEORGE HERBERT WILSON.

LONGITUDINALS.

To continue along the line of longitudinal stiffness, the longitudinals or keelsons of a boat will bear a certain amount of inspection to decide upon the best mode of construction and to locate them at that part of the ship from which will be derived the greatest benefits. The principal keelson or longitudinal—the vertical keel—has already been discussed and it remains for this portion of the work to demonstrate the value of the additional strength gained and the functions performed by the longitudinals. The condition of the ship when under a "hogging" or "sagging" strain being two of the worst, will be taken in connection with the above values. To arrive at the proper decision as to their best disposition will require a full knowledge of the functions they will be called upon to perform when in such conditions.

Like the vertical keel, the longitudinal is required to give a certain amount of local strength; to act as it were as a "strong-back" for that part of the structure which it traverses and to distribute and take upon itself the various strains which are constantly occurring in its vicinity. As a strong-back or back-bone, as the keelsons are called, the longitudinals are of necessity an important factor, and to consider it at all, it must be under the worst circumstances. This is undoubtedly true when the boat is at an angle of heel sufficient to bring the longitudinal in question in a vertical plane, this being the plane at right angles to the water line—the position previously occupied by the vertical keel. Assuming this change of position, and regarding the boat as on the crest or in the hollow of a wave, it follows that its functions are practically those of the vertical keel which it has displaced.

It must not be presumed from this condition of affairs, however, that the longitudinals should equal the strength of the displaced keel, else would result the ridiculous display of several vertical keels located along the transverse section. In addition to the support given by this longitudinal must be considered the partial aid gained by the keel in its new position. The keel's line of greatest efficiency being destroyed it is not to be presumed that it is useless as a factor in resisting longitudinal stresses. Though the strains must act upon it in an oblique plane it still retains a great amount of resistance to bending. This is mostly effected by its strong connections to the adjacent structure and by the rigidity of the keel itself.

Thus it will be seen that the longitudinals can be diminished in scantlings from that of the keel. This decrease is to a marked degree proportional to the distance of the same from the center line of the boat, measuring along the girth. The proportionate decrease can readily be accounted for when the conditions dependent upon the various longitudinals are taken into consideration. Relying upon the longitudinals to act as partial keels when in a heeled condition, it follows that those longitudinals lying within the limit of the "probable heel" will require greater strength than those outside of this limit. The angle of probable heel has a maximum of about 25°. The exception is the case when a greater angle of heel occurs, and in such an instance the nearest deck or longitudinal bulkhead can be relied upon to assist in resisting the strains. Longitudinals lying without the limit of "probable heel" are generally of smaller proportions. Their functions are to resist the crushing strains of huge waves hurled against the structure and those incident to coming alongside of docks, ships, etc.

But it is not in resisting the longitudinal strains alone that the side keelsons are important. In addition to these duties, they are depended upon for a great amount of local stiffness and for transmitting the strains and vibrations through the structure. As a part of the equivalent girder for a boat in the upright position the longitudinal is not as important as the shell plating or inner bottom (very few boats of this class have the latter except in wake of tanks), but it tends to thicken up the vertical web connecting these two members. In some of the later boats, built and now building, the longitudinals have entered largely into the construction of the engine and boiler foundations and tank sides. With the general characteristics and duties of the longitudinals outlined, an investigation into the practical methods of meeting these is pertinent.

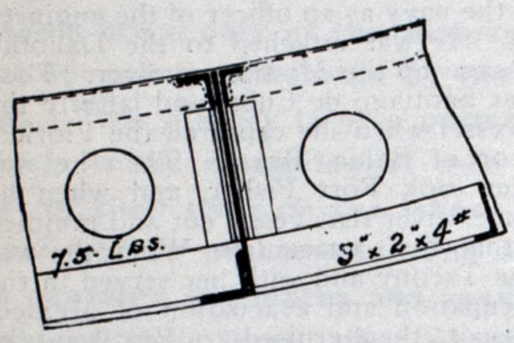
Longitudinals, like the vertical keel, should in some manner maintain a continuity of metal in some or part of some of its members. This is effected in various ways and along different lines. The manifold constructions of this portion of the hull structure are governed by the type of boat, her use and service, by the surrounding structure and by the question of economy. It will aid to enumerate them as follows:

1. In some cases the floors are cut entirely, allowing of an entire continuous longitudinal with continuous double angles at the top and clips at the bottom for shell connections. The longitudinal plate is scored out over the frames and is secured to the floor plates by two or four vertical clips as the strength requires.

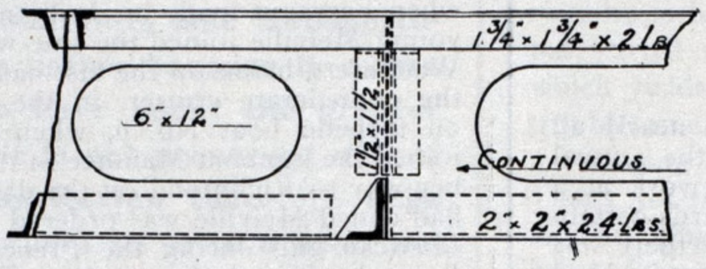
2. In others the floor is scored out at the top to receive the longitudinal plate, and the longitudinal is scored out at the bottom to let down over the floor plate, thus insuring partial continuity in each. Continuous angles at the top and clips to the shell and floor plates are features of nearly all longitudinals.

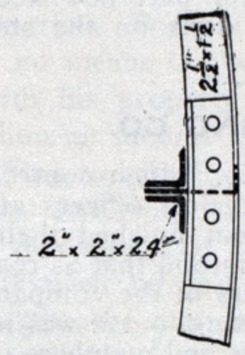
3. This method consists of making the longitudinal plate intercostal with continuous angles at the top and bottom. This requires the cutting

PLATE 3.

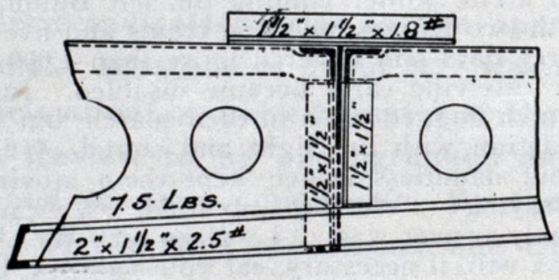


SKETCH -1-



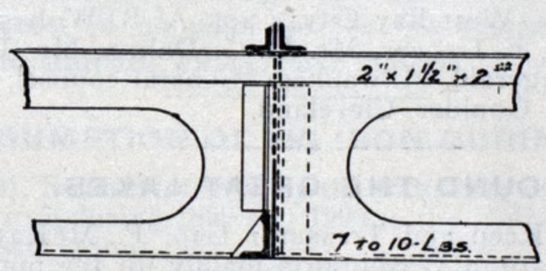


SKETCH -5-

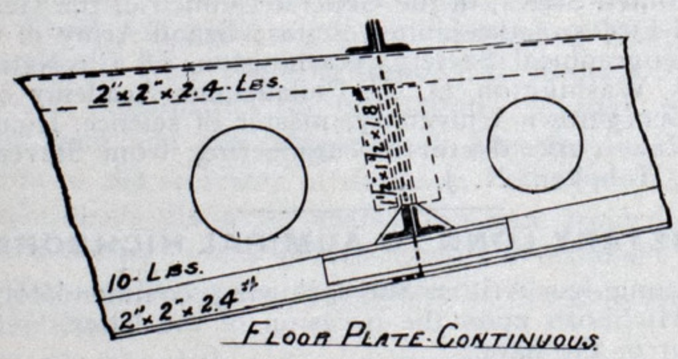


SECTION OF LONG'L.

SKETCH -2-

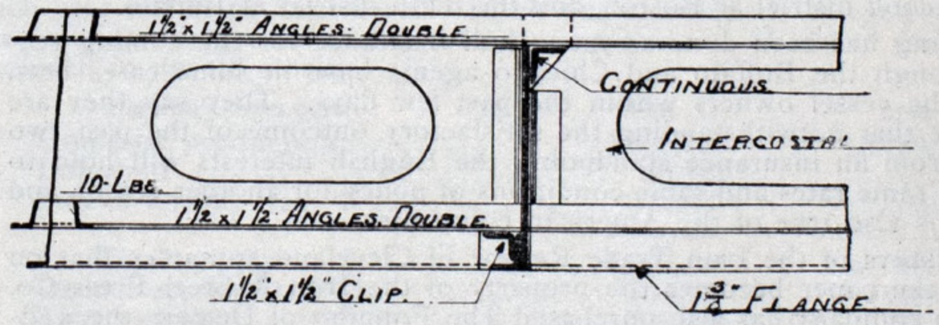


SECTION OF FLOOR PLATE



FLOOR PLATE-CONTINUOUS

SKETCH -4-



of the frame angles and is not considered the best practice, so for that reason it will not be taken into consideration.

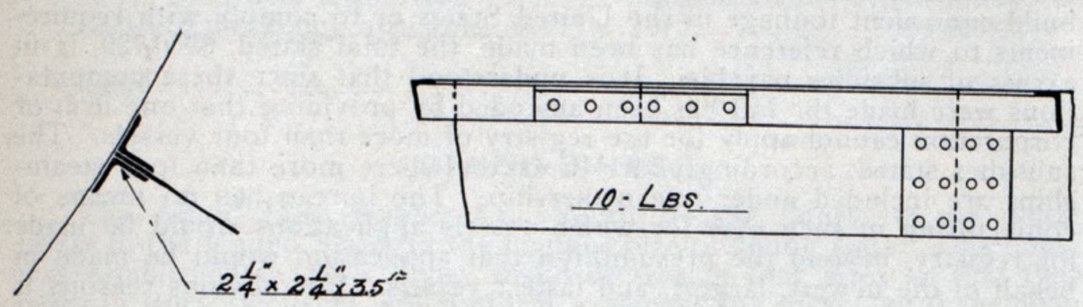
4. Another construction is to use intercostal plates with intercostal angle clips for shell connections. A double continuous angle is carried near the lower edge on top of the frame angles through the floor plates, these having been scored out to receive the angles. Small clips riveted to the frames will take a rivet in each angle. Two continuous angles are worked along the upper edge on top of the reverse bars; vertical clips make sufficient connection to the transverse floors. The great objection to this practice is the working into place of the lower continuous angles. It is hardly possible to use this construction unless the holes for the angles have ample clearance and the floors lightened by holes in the vicinity of the longitudinal.

5. Still another fore-and-aft member is formed, continuous plates flanged to the shell and scored out over the frames with a continuous angle on the upper edge resting on and riveted to the reverse frames.

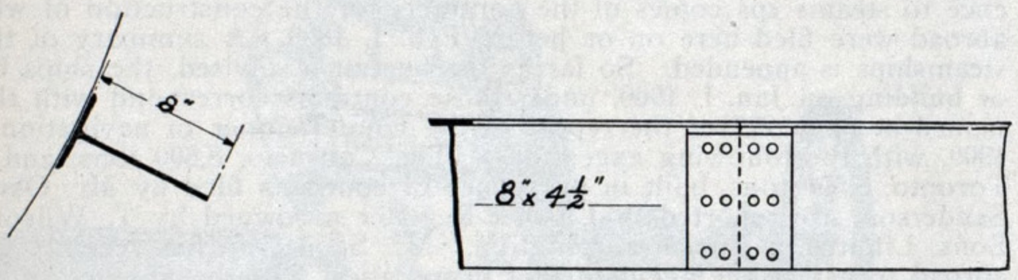
These numerous methods of construction have their good points and advantages as regards efficiency, ease in erection and economy. These important qualities must be embodied in a good construction and the best results are sure to follow.

Not presuming to have arrived at an ideal construction, I would suggest types of longitudinals most likely to meet with favor. Everything considered these types I will limit to two—one for the region of "probable heel" and the other outside of it. We have the first of these shown on

PLATE-4.-



SKETCH A.



SKETCH B.

plate 3, sketch 2, the details of this construction having already been outlined in paragraph No. 2, just preceding. In addition to this, it might be well to suggest the substitution of a flange on the lower edge of the longitudinal plate, in lieu of the intercostal clip. This insures lighter construction. The connection of the vertical clips to the floor plates should be very rigid and well riveted. Additional connection is made to the fore-and-aft angle by the double-angle butt strap worked on top of the reverse bars and floor plate flanges. This makes a strong connection between the severed portions of the floor plates and the reverse bar. This type of longitudinal has a number of excellent features and there are many reasons for adopting it, efficiency being an important consideration. It is well cared for in the continuity of metal provided. Simpleness of construction and consequent lessening of cost is likewise thought of in the few parts to work, which is not the case in intercostal work generally.

For a type of longitudinal, outside of the heeling limit, a much simpler construction is sufficient to answer all the requirements. This type is portrayed in sketch 5, plate 3, and practically explains itself. The longitudinal plate is made continuous, being scored out over the frames and reverse bars. Connection is made with the shell either by angle clips or by the plate being flanged, as in the other longitudinal. On the upper edge a continuous angle is shown, the butts of the angle making a good shift with those in the plate. Double angles are sometimes used where greater strength is required. Bosom-angle butt-straps should always be used for these continuous angles. These upper angles should have their wider flange perpendicular to the shell to gain the best effects, allowing of a greater area of continuous metal, both in plate and in angles. Other longitudinals are practically formed by the lower strake of the fore-and-aft bulkhead and its connections to the shell and transverse frames. The stringer plates of the decks also perform this duty.

More space could be devoted to the subject of longitudinal construction, but it would entail a rather bulky volume. This work will not allow of too lengthy a discussion on each subject, for the reason that its object as an efficient hand book would thus be destroyed. Sufficient ground has been and will be covered to enable the work to be of value to those for whom it must necessarily mean the most. The numerals used to designate the types in this text have been followed in the sketches with the exception of type 3, which has been disregarded as poor practice.

BILGE KEELS.

The bilge keel forming, as it does, an external longitudinal, in addition to its regular functions, should be included in this group of fore-and-aft members. Although its construction is such that the only connection possible is to the shell plating, it has a value as a longitudinal member from its depth and shape. Methods of construction as regards the bilge keel are rather limited in this class of boats, as it is only on the larger boats, or destroyers, that it has come into use. Two types are perhaps available for this work and will answer all requirements. The first (sketch A on plate 4) is built up of a single plate connected to the hull by a continuous angle on the top and bottom. Bosom-straps for the angles and double plate straps for the plate should be used at the butts. At each end the plate should be tapered in an easy manner to conform to the curve of the hull, with all sharp corners on plates, angles and butt straps removed by filing.

The other type is very similar to this and is shown in sketch B, plate 4, on the midship section. The close resemblance between the two will be seen now, but the work of fitting and erecting the latter is somewhat simpler. This type is merely a large "I" section with one flange planed or cut off. The simplest and cheapest method of doing this is by making a cut through the web, close to the flange, but clear of the fillet. This can be done on the planer and consumes less time than the laying off of the holes in the plate and angles and riveting the same as would be required in the other type. Bending, punching and riveting is now all that is required for completion. A double flanged plate was used at the bulbs, and the ends tapered and edges filed as in the former case. The trace of the bilge keel should be in as straight a plane as it is possible to have it and it should be near to a parallel with the load water plane to cause as little friction and consequent reduction in speed as possible.

An excursion into theoretical problems regarding the action of bilge keels would hardly be appropriate here as it has little to do with the method of construction. It is the intention of this work to keep aloof from the higher theoretical problems and devote time and space to the practical ideas involved.

In the next of these articles some ideas will be advanced concerning the transverse framing of these boats.

SHIP YARDS ARE BUSY.

SEVERAL OF THE COAST YARDS HAVE SECURED NEW CONTRACTS—LAUNCH OF ANOTHER FOUR-MASTER—GENERAL NOTES.

At the works of the Townsend & Downey Ship Building & Repair Co., Shooter's Island, New York, there are no less than eleven contracts on hand for new hulls, several of which are in course of construction. They have up the frame for a composite hull, steel framed, for the United States coast and geodetic survey, to replace the steamer Bache. The dimensions of the new boat are: Length, 163 ft.; beam, 27 ft. A steel schooner yacht designed by H. C. Wintringham for R. E. Todd is also under way. The dimensions are: Length on deck, 144 ft.; breadth of beam, 27 ft. 10½ in.; depth, 18 ft. Two steel schooner yachts designed by Cary, Smith & Barbey are also to be built. The dimensions of each will be: Length, 99 ft. 1 in.; length on water line, 68 ft.; breadth of beam, 20 ft. 1 in., and depth 15 ft. 4 in. A double-decked wooden ferry-boat, designed by H. J. Gielow for the New York & College Point Ferry Co., will also be set up shortly, the dimensions of which are: Length over all, 175 ft.; length on load water line, 160 ft.; breadth of beam over guards, 60 ft. 6 in. Mr. Gielow has also designed two power launches of 60 ft. by 12 ft. and a depth of 5 ft., which are also to be built there. A 21-ft. sloop yacht for Mr. J. E. Beggs, a race-about also of 21 ft. water line, and an auxiliary yawl of 39 ft. by 11 ft. beam are also under construction.

The Spedden Ship Building Co., Baltimore, Md., is building a large ocean-going tug for sale. The tug will be of the following dimensions: Length of keel, 90 ft.; length over all, 105 ft.; breadth of beam, 21 ft.; breadth, over guards, 22 ft. 6 in.; depth of hold, 11 ft.; draught of water, 11 ft. The hull is being built in the strongest possible manner of mild steel and subdivided into bulkheads. The engine will be of the compound type, with cylinders of 15 and 30 in. diameter and 22 in. stroke; I. H. P. 450. The steel boiler, built in the Spedden shops, will be of the Scotch type with a total grate surface of 50 sq. ft. and a total heating surface of 1,400 sq. ft. The tug will cost $35,000.

A four-masted schooner, the Charles S. Hirsch, built by Kelley, Spear & Co., Bath, Me., for Charles S. Hirsch & Co. of New York, was launched this week. The schooner's length is 173 ft., depth of hold 13 ft., and gross tonnage 620. She is fitted with steam windlass, wrecking pumps and many modern contrivances for assistance in handling cargo.

A. Axton & Sons, Brownsville, Pa., have been awarded a contract to build a hull for a boat to be used in towing freight on the Yukon river. It will be 86 ft. long and 36 ft. beam. The timber will be cut out at Brownsville and shipped to the Pacific coast, where it will be set up. James Rees & Sons Co. will build the engines.

The new steamboat Saturn, building at the Kahlke Bros. ship yard, Rock Island, Ill., will have compound engines, a novelty for the upper Mississippi. She will be 154 ft. long, 34 ft. beam and 4½ ft. depth of hold. The hull timbers are of Oregon fir. She is owned by Capt. George Winans of Waukesha, Wis.

It is quite likely that the Bath Iron Works, Bath, Me., will build a supplemental plant in the near future. The company has much business on hand and is greatly hampered for room. Whether the plant will adjoin the present one or will be located elsewhere has not yet been ascertained.

The capital stock of the Fore River Engine Co., Quincy Point, Mass., which has just been incorporated, is $4,000,000, one-half of which is to be preferred stock limited to 7 per cent. non-cumulative dividends.

A contract has been awarded to William McKie of East Boston for the construction of a double-decked four-masted schooner for John S. Emery & Co. of Boston and others. She will be 165 ft. long.

The navy department, having waited what it deems an entirely adequate time for the consummation of the contracts for the new protected cruisers, has informed the bidders that unless they reach a final agreement with the government by March 2 bids for these vessels will be readvertised. The contracts were conditionally awarded to Neafie & Levy on Feb. 10 and to the Newport News Ship Building & Dry Dock Co. and the Bath Iron Works on Feb. 12.

SHIPS AVAILABLE FOR FOREIGN TRADE.

A REPORT FROM THE COMMISSIONER OF NAVIGATION DEALING WITH THE NUMBER OF VESSELS ENGAGED IN FOREIGN COMMERCE AND THE NUMBER ENGAGED IN THE COASTWISE TRADE THAT COULD BE REGISTERED FOR FOREIGN TRADE.

In response to a resolution of the United States senate during discussion of the ship subsidy bill, the secretary of the treasury submitted to the senate, a few days ago, a statement, prepared by Mr. E. T. Chamberlain of the bureau of navigation, relating to the number of vessels of the United States engaged in foreign commerce, the number of vessels now engaged in the coastwise trade that could be registered for foreign trade under the provisions of the pending shipping bill, and a list of ships contracted for abroad. The report is a compilation, along the lines suggested by the senate resolution, from the list of merchant vessels of the United States for the fiscal year ended June 30, 1900, and which is published in book form and known as the government blue book of shipping. This list gives the name, tonnage, whether propelled by sail or steam, and year of build (with other particulars) of each of the 23,333 vessels covered by the senate's resolution of inquiry. The year of build, save in exceptional cases, is the year when the vessel obtained documents, register enrollment, (and or) license as a vessel of the United States.

Of these 23,333 vessels, 1,330, aggregating 826,694 gross tons, were on June 30, 1900, registered for the foreign trade (including forty-two of 9,899 gross tons, registered for the whale fisheries). A list of all registered steam vessels and of registered sail vessels of 1,000 tons or upward may also be found in the report of the commissioner of navigation for 1900, pages 173 to 178, inclusive. The number of vessels enrolled and licensed or licensed for the coasting trade on June 30, 1900, was 22,003 of 4,338,145 gross tons (including 1,435 of 51,629 gross tons, licensed for the cod and mackerel fisheries).

"The resolution required," says the commission, "the number of vessels engaged in the coasting trade which can be registered for the foreign trade under the provisions of the ship subsidy bill. There is no legal obstacle to the registry of each of these vessels for the foreign trade if over 30 tons. There are, however, reasons other than statutory why many of these vessels cannot take out registers to engage in foreign trade. The length of the canal locks precludes the passage to the sea of many of the larger vessels of the great lakes. Light-draft vessels engaged on rivers are not adapted to ocean navigation. The commercial advantages of the coasting trade restricted to American vessels are greater in many instances than advantages from the proposed subsidies payable to vessels in the foreign trade in competition with foreign vessels. For these and other reasons it is not practicable to state the number of vessels now engaged in the coasting trade that can be registered for the foreign trade, or the amounts which such vessels would receive if the bill were to be passed, if contracts were made as provided in the bill, and if voyages, the number and description of which is purely conjectural, were to be made.

"The voyages of American vessels in foreign trade eligible to subsidies during the calendar year 1899, together with the subsidies payable under the ship subsidy bill, are stated in the report of the commissioner of navigation for 1900 at pages 192 to 272, inclusive. The preparation of a similar table covering voyages during the calendar year 1900 would necessitate reports from all collectors of customs and computations thereon, requiring from six weeks to two months. The figures for the calendar year 1900 could not differ materially from those for 1899, because American tonnage registered for foreign trade decreased from 848,246 tons on June 30, 1899, to 826,694 tons on June 30, 1900, as follows:

	1899.		1900.	
	Number.	Tons.	Number.	Tons.
Steam, iron and steel	135	288,813	124	271,378
Steam, wood	232	71,217	214	69,964
Sail, wood and iron and steel *	964	488,216	992	485,352
Total	1,331	848,246	1,330	826,694

* Including barges.

"The subsidies stated are based on the assumption that each vessel had complied with the requirements of the bill, as follows: First, that the vessel cleared with cargo to the amount of 50 per cent. of her capacity for carrying commercial cargo; second, that the vessel, if a steam vessel, of specified speed and tonnage, was suitable for carrying the mails of the United States, and as auxiliary to the power of the United States in time of war or other need; third, that cargo, passengers or mails were carried over the entire distance computed; fourth, that each vessel was of the class A1, etc.; fifth, that at least one-fourth of the crew were citizens of the United States, etc.; sixth, that on a test by naval officers each steam vessel had attained the speed at which subsidy is computed; seventh, that the vessel was officered in compliance with section 4131, revised statutes, and amendments; eighth, that the owner of each vessel had contracted to build additional new tonnage; ninth, that each vessel carried American boys; tenth, that each vessel had carried, if required, the United States mails free of charge.

"It is practicable to determine whether some of these requirements were complied with only by examination of the manifests, crew lists, etc., of each voyage of each vessel. It is practicable to determine whether other of these requirements would be complied with, if the bill were to be enacted, only by inquiry addressed to owners concerning their purpose to avail themselves or not of the provisions of the bill. In so far as there may have been in the case of any voyage of any vessel included in the tabulation a failure to comply with any of the requirements described, the total, $2,906,997, exceeds what actual subsidies would have been if the bill had been a law.

"Since the computations referred to were prepared and published it is understood that the bill has been amended by providing that vessels of 20 and 21 knots speed are to receive additional subsidy at the rate of 1.6 cents instead of 2 cents and 2.3 cents, respectively. This amendment will reduce the subsidies payable on the voyages of the St. Louis, St. Paul, Paris and New York, included in the tabulation, by the sum of $221,106. The bill has also been amended by the following proviso: A vessel on voyage during any part of which she shall have carried cargo which under the laws of the United States could not lawfully have been carried in a foreign vessel; provided, nevertheless, that any such vessel otherwise entitled to compensation under this act shall not be debarred from receiving such compensation by reason of anything in this section contained, except to the extent of the proportion which that part of her cargo appertaining to domestic commerce bears to her capacity for carrying commercial cargo.

"The effect of this proviso is to provide a partial subsidy for vessels not included in the computations referred to, such as vessels from New York to Colon, Panama to San Francisco, Pacific ports via Honolulu to foreign ports, etc., carrying cargo part of which is carried under the restrictions of the coasting law, and part of which for foreign ports is carried in competition with foreign vessels. The subsidies payable in such cases could be determined only by ascertaining the amount and destination of cargo on each specific voyage. The number of American vessels engaged in this trade is relatively small.

"The number of foreign-built vessels not having an American register, but authorized by the bill to receive registry, the tonnage, speed, year built, and subsidies payable on voyages made during the calendar year 1899, so far as the bureau has been able to ascertain the facts, are stated in the report of the commissioner of navigation for 1900, at pages 273 to 276, inclusive. In so far as the owners of these vessels failed to build equivalent tonnage in the United States or to comply with requirements to which reference has been made, the total stated, $930,729, is in excess of subsidies payable. It is understood that since these computations were made the bill has been amended by providing that one firm or corporation cannot apply for the registry of more than four vessels. The subsidies stated, accordingly, are in excess where more than four steamships are included under one ownership. The bureau has no means of conjecturing in such case for which vessels applications would be made for registry, beyond the presumption that application would be made in behalf of the newest, largest, and fastest vessels. For obvious reasons it is impracticable to ascertain the full extent to which American capital may be invested in steamships under foreign flags to the extent of owning a majority interest.

"The resolution also calls for 'the number of foreign ships registered as contracted for to be built prior to Feb. 1, 1899, and the tonnage of each of said ships.' The list of such vessels eligible to subsidy, with the subsidies payable on the routes for which they are destined, may be found in the report of the commissioner of navigation for 1900, at page 277. That list included such foreign-built steamships as were actually under construction abroad on or before Jan. 1, 1900, for American capital, as provided in the bill at the time the report was prepared, so far as the bureau could ascertain. Since that time the bill has been amended by the reference to steamships copies of the contracts for the construction of which abroad were filed here on or before Feb. 1, 1899. A summary of these steamships is appended. So far as the bureau is advised, the ships built or building on Jan. 1, 1900, under those contracts correspond with those named at page 277 of the report of the commissioner of navigation for 1900, with the following exceptions: The Consuelo, 8,600 tons, and the Toronto, 8,500 tons, built in pursuance of contracts filed by Mr. Oswald Sanderson, are reported in Lloyd's Register as owned by T. Wilson & Sons, Limited, a British corporation. Mr. Sanderson has recently gone abroad to act as the agent of that corporation. In the absence of conclusive evidence of continuous American ownership, it does not appear to the bureau that these two vessels are eligible to registry."

Ships referred to by the commissioner in the foregoing paragraph and which will be eligible to subsidy on account of provision of the bill relative to vessels contracted for abroad number forty-two and are as follows:

Owner.	Names.	Gross tonnage.	Date of contract.
International Navigation Co.	Vaderland	12,000	Nov. 22, 1898
International Navigation Co.	Zeeland	12,000	Nov. 22, 1898
International Navigation Co.	Marion	10,000	Dec. 14, 1898
International Navigation Co.	Haverford	10,000	Dec. 14, 1898
W. R. Grace	Cumbal	4,259	Jan. 4, 1899
B. N. Baker	Minneapolis	13,401	Apr. 7, 1897
B. N. Baker	Minnehaha	13,401	Apr. 7, 1897
B. N. Baker	Minnewaska	13,400	Apr. 7, 1897
B. N. Baker	Minnetonka	13,400	Apr. 7, 1897
B. N. Baker	Mobile	13,400	Oct. 28, 1898
B. N. Baker	Mississippi	13,400	Oct. 28, 1898
B. N. Baker	Massachusetts	14,400	Oct. 28, 1898
B. N. Baker	Manitoba and five not named	13,400	Oct. 28, 1898
W. D. Munson	Two not named	3,200 3,200	Jan. 10, 1899
Jefferson Hogan (wrecked)	Mariposa	4,656	Jan. 30, 1899
Jefferson Hogan	Mineola	4,860	Jan. 30, 1899
C. W. & J. Hogan	Mohawk and eleven not named	4,860	Jan. 30, 1899
Lorenzo Daniels	Two not named		Jan. 30, 1899
Oswald Sanderson	Consuelo	8,600	Jan. 20, 1899
Oswald Sanderson	Not named		Jan. 20, 1899
Oswald Sanderson	Not named		Jan. 20, 1899
Oswald Sanderson	Not named		Jan. 11, 1899
Oswald Sanderson	Not named		Jan. 20, 1899
Oswald Sanderson	Toronto	8,500	Jan. 10, 1899

The British government has again begun the construction of torpedo boats. Five years ago it abandoned the torpedo boat and began building larger and speedier craft of the destroyer type. J. I. Thornycroft & Co., Chiswick, have just launched two torpedo boats, however, for the British navy and they will be officially known as Nos. 98 and 99. Thornycroft has two more similar boats on the building stocks well advanced. The length of these boats is 155 ft.; beam, 17 ft.; draught aft, 8 ft. 5 in.; I.H.P. 2,800, and speed 25 knots. They are, therefore, the same size as the Dahlgren and T. A. M. Craven of our own navy, but they have a speed of 5 knots per hour less than our crack flyers. The first torpedo boat built for the British navy was the Lightning, officially known as No. 1. She is only 85 ft. long, 10 ft. 10 in. beam, 5 ft. draught, 400 H.P. and 18½ knots speed.

RIVER AND HARBOR APPROPRIATIONS, 1878 TO 1900.

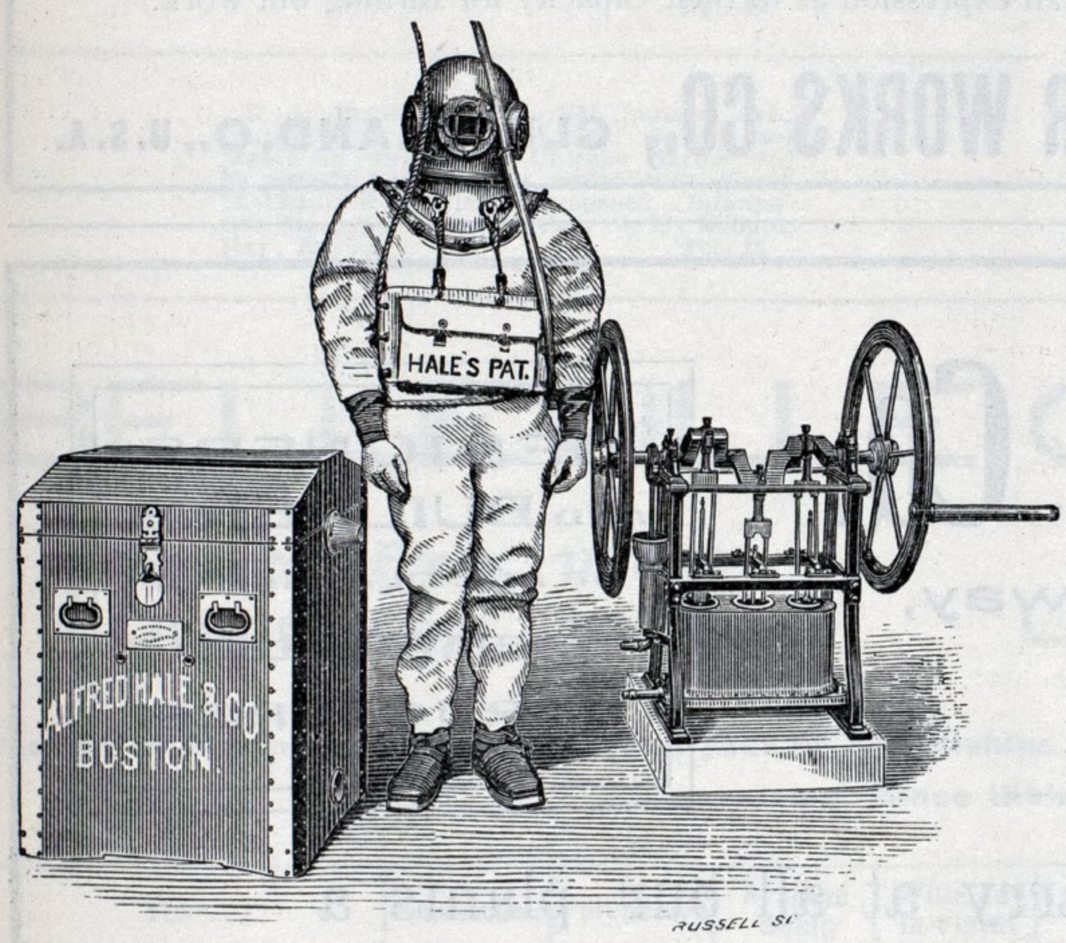
Appropriations made by the United States government for river and harbor improvements from 1878 to 1900, inclusive, aggregate $321,845,595.88. This includes the items known as continuous contract items, which, after their adoption, are provided for by appropriations in the bill known as the sundry civil appropriation bill. The following table shows appropriations carried by the different bills that have been passed since 1878:

FUNDS PROVIDED FOR RIVER AND HARBOR IMPROVEMENTS BY THE UNITE STATES GOVERNMENT.

Years.		Appropriations.
1878		$ 8,201,700.00
1879		7,864,600.00
1880		8,951,500.00
1881		11,441,300.00
1882		18,738,875.00
1884		13,949,200.00
1886		14,473,900.00
1888		22,397,616.90
1890—Direct appropriations	$25,136,295.00	
Contracts authorized	13,282,979.00	—38,419,274.00
1892—Direct appropriations	$21,154,218.00	
Contracts authorized	31,760,521.00	—52,914,739.00
1894		11,473,180.00
1896—Direct appropriations	$12,852,235.00	
Contracts authorized	59,649,309.91	—72,501,544.91
1899—Direct appropriations	$16,091,841.94	
Contracts authorized	23,866,324.13	—39,958,166.07
1900—(Emergency act, June 6)		560,000.00
Total		$321,845,595.88

DIVING SUITS.

The Alfred Hale Rubber Co., South Boston, Mass., is the oldest house in the United States in the manufacture of diving suits. This house was established in 1837. They make dresses in four sizes so that they carry in stock suits that will conform to almost any diver, but if the diver is of unusual proportions they make a special dress to order. Hundreds of divers in all parts of the country are using dresses made by the Alfred Hale company and the report invariably heard regarding them is that they are the very best to be had, both in quality and shape. On this score



one of the officers of the company says: "We do not undertake to make cheap work. We strive to manufacture nothing but that which is the very best, so as to maintain for our goods the standard they have always borne. Our prices are as low as durable and safe work can be furnished at. We know that the best goods are the cheapest and where human life is at risk the quality can be none too good. In our whole course of business, extending over half a century, we have never been called upon to replace a dress as defective or imperfect."

Dresses made by this company are used by leading contractors, wrecking companies, divers, railroads, water works, steamship companies, pier builders, etc., etc., and many of them are in use at the present time in the United States navy. They also manufacture everything connected with diving, such as divers' mittens, gloves, cuffs, pumps, face and neck gaskets, repair cloth, snap tubing, submarine hose, helmets, shoes, weights, etc. In the manufacture of these articles their first aim is to maintain the same high standard that they do in suits.

A dispatch from San Francisco announces that the Oceanic Steamship Co. has levied an assessment of $10 a share on its capital stock, payable at once and delinquent in sixty days. A. B. Spreckels, who is in charge of the Oceanic company in the absence of his brother, said that there were several causes for the assessment. One was the delay of the Cramps in delivering their new steamers, thus preventing earnings anticipated from them. The expense of fitting and bringing steamers from the east was much heavier than was expected. The $100,000 of bonds of the company were taken up in advance of the arrival of steamers and $235,000 has been expended in repairs on the Alameda and Mariposa. The assessment will produce $250,000 as there are 25,000 shares.

TRADE NOTES.

Mr. J. C. Halladay, for many years western sales agent of the Pickering Spring Co. of Philadelphia, with headquarters at the Great Northern building, Chicago, has resigned that position to accept a position with the Chicago Pneumatic Tool Co. as manager of a new department to be established by the Chicago company March 1.

In the year 1900 the J. A. Fay & Egan Co. of Cincinnati, manufacturers of wood working machinery, took out about 100 patents. They say their machines are being copied and have retained a celebrated firm of lawyers to go into the subject of infringement of their patent rights. Neither J. A. Fay & Co. nor the Egan Co. have had patent suits of any kind since consolidation in 1893, but they say that as a joint company they now propose to test their rights in the courts.

J. C. Paul & Co., corner of Randolph and Dearborn streets, Chicago, manufacturers of "Burnishine" in liquid and solid form, have a very large trade among vessel owners for this metal polish. Many of the large passenger and freight lines on the Atlantic and Pacific use it exclusively. On the lakes its use extends to all the leading lines. Now that fitting out time is approaching, engineers and captains are again reminded to include this labor and metal saving cleansing agent in orders for material with which to fit out their boats. It is for sale in every port.

The Standard Pneumatic Tool Co. of Chicago, manufacturers of the "Little Giant" air tools and appliances, have moved their New York offices from 619 Washington Life building to more commodious quarters at 611-612-613 of the same building, this being necessitated on account of the very great increase in their business in eastern and foreign territory during the past few months. All shipment for customers in the district just mentioned will be made from New York instead of Chicago, thus expediting the delivery of machines.

Capt. M. De Puy of No. 19 South street, New York, writes that Riter Bros. & Co. (Eagle Boiler Works) of Buffalo have orders for four of his Paragon boilers to go to Oregon. Capt. De Puy is in receipt of the following from the J. H. Johnson Ship Building Co. of Portland, Ore.: "Please give us cost of Paragon boiler with 500 ft. of heating surface and suited to working pressure of 150 lbs. Boiler would require fire box of not less than 3 ft. depth on account of wood being used as fuel. Now I wish to say that the boiler we had built from your plans, with 1,500 ft. of heating surface, is giving entire satisfaction and is furnishing more steam for weight and space occupied than any boiler we have ever seen."

A unique mechanical draft arrangement, consisting of two fans, was recently installed at the works of the Diamond Rubber Co., Akron, O., by the B. F. Sturtevant Co. of Boston, Mass. Of its operation the owners write that "with the forced draft at one end and the induced draft at the other, we are enabled to produce a terrific draft and can make steam very rapidly indeed. We have been able to produce a pressure of 1.7 oz. by the forced draft fan and maintain a 2-in. water column at the extremity of our underground breeching or at the inlet of the fan. The construction of the fans is neat, strong and workman-like and the engines run cool and practically noiseless. Taking all into consideration we are very well pleased."

F. B. Vandergrift & Co., custom house brokers and general forwarders, of 66 Beaver street, New York (315 Dearborn street, Chicago), announce that they handle and forward export shipments to all parts of the world. They have agents in all the principal cities in the United States and throughout the world. On imports they quote through rates from all points abroad to inland points in the United States. They are the import freight agents of the Delaware, Lackawanna & Western Railroad Co. at New York. They pay duties at New York or Chicago, or forward in bond where shipments are destined to an interior point where there is a custom house. They also attend to marine insurance on all shipments where requested by the owners to do so, under an open marine insurance policy covering shipments from warehouse to warehouse.

Since the introduction of the Shaw & Spiegle towing machine in Europe, English shipping journals have had much to say in praise of it. Syren & Shipping of London says in a recent issue: "The case with the powerful British tug William Joliffe and ship Primrose Hill, which broke adrift from a 16-in. hawser, furnishes an idea of the immense strain a towline is subject to during a heavy sea. There is one way to obviate this and that is by using the steam towing machine, which is the only arrangement by which the strain on a towing hawser can be absolutely limited to prevent parting. By this machine not only small craft, but the largest dry dock, monitors, transports and battleships can be towed with perfect safety. Its distinctive feature is that by means of its driving and cushioning steam cylinders there is provided an elastic steam cushion and an automatic relief on the hawser, without which the latter would be continually straining and frequently breaking. A manila hawser, although it is more elastic than one of steel, is very bulky to handle or to stow on a barge, and it also becomes very expensive on account of its ordinary wear and tear. A steel wire hawser will last apparently for an almost indefinite time without stranding, or even straining, as appears from practical use. The steam towing machine is well adapted for ocean steamers, as better assistance can be rendered to disabled vessels to bring them to port than can be offered by any other means heretofore available. The salvage gained by the saving of one ship would pay many times over the price of a steam towing machine."

Mr. Geo. H. Wilson, who has been chief hull draftsman in the office of the superintending naval constructor at the Harlan & Hollingsworth Co.'s works, Wilmington, Del., has resigned from the navy department and accepted a position with the Harlan & Hollingsworth Co. as special superintendent in charge of the torpedo boat destroyers Stringham, Hopkins and Hull. Mr. Wilson has been connected with the navy department since 1891 when he was appointed by Secretary B. F. Tracy. His duties have brought him in contact with various boats in the navy, among which are the Concord, Bennington, Bancroft, Marblehead, Cincinnati, Maine, Terror, Puritan, Machias, Castine, New York, Foote, Rodgers, Winslow, McKee, Stringham, Hopkins and Hull. In his new position Mr. Wilson will be enabled to continue along the line of designing and fitting these boats out, as he has in the past had the major portion of such work under his care.

CLERGUE ENTERPRISES.

Since his return from Europe a short time ago F. H. Clergue, who is the leading spirit in the expenditure of several million dollars in water power canals and other enterprises near Sault Ste. Marie, Ont., has given out the details of a charcoal iron project which he has under way.

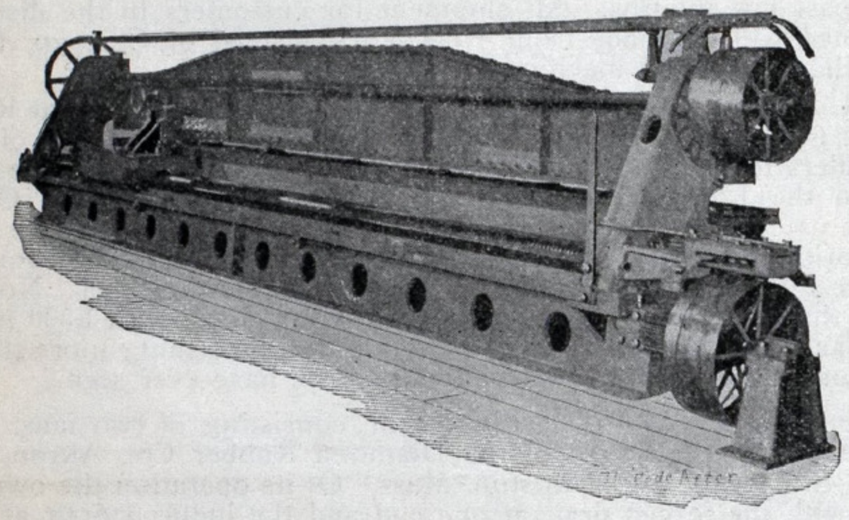
"We are now having prepared," Mr. Clergue says, "plans for two charcoal blast furnaces which will be very much larger than any yet attempted. The fragile character of the fuel has supposedly prevented the adoption of larger furnaces for charcoal work; we are not convinced that the profitable limit as to size for charcoal furnaces has been reached, but have wondered if the difficulty of obtaining proper fuel has not been the principal restraining influence with every charcoal iron works. The location of our Algoma Central railway, through 1,000 square miles of hard wood forest, will secure our charcoal furnaces an ample supply of fuel, while our arrangements for the manufacture and sale of our by-products will serve to very largely reduce the cost of our fuel. We have refrained from public mention of this project, for the reason that we have felt it necessary to exhaust the experience of charcoal furnace practice before engaging in so radical an advance. The matter is now fully determined, however. We have on hand 200 carloads of material for another enterprise, our Bessemer plant, and the foundations are already well under way. The erection of a part of the machinery has commenced. The Riter-Conley Co. has secured the contract for the erection of the steel structures, but all the walls will be of stone, conformable architecturally to our other works at the Sault. The Bessemer plant will consist of two converters having a capacity for 600 tons daily, besides which there will be two tilting open hearth furnaces with a capacity of 50 tons each daily. The Midland furnace of the Canada Iron Furnace Co. is now producing 125 tons daily of excellent pig iron from our Helen ore, which has proved itself exceptionally desirable in the furnace."

The Hohenzollern of the Nord Deutscher Lloyd, which has just completed a round trip across the Atlantic—Gibralter to New York—is not a new vessel, as some shipping men suppose. She is the Kaiser Wilhelm II, an old friend on the Mediterranean and New York service, which has also plied in the Australian trade. The old Hohenzollern was recently sold, as she was no longer equal to the requirements of the day.

The two first-class cruisers Good Hope and Bacchante were launched on the Clyde last week. It is asserted that the Good Hope is the most formidable cruiser in the world. She is 500 ft. long, has a displacement of 14,100 tons and is expected to develop a speed of 23 knots per hour. The Bacchante, which is of the Cressy type, has a displacement of 12,000 tons.

This illustration represents our

PLATE PLANER



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YOUNGSTOWN, O.

SHIP YARD OPERATIONS AT NEWPORT NEWS.

[Special correspondence to the Marine Review.]

Newport News, Va., Feb. 26.—The announcement of the date for the preliminary trial of the battleship Illinois, now nearing completion at the plant of the Newport News Ship Building & Dry Dock Co., is being awaited here with a good deal of interest. It was at first thought that the trial would take place Feb. 15, but the builders were unwilling to stop work on her then. Very rapid progress on important portions of her equipment was being made at that time and it was thought best to put off the preliminary run until the ship was practically ready for commission. Supt. Post thinks that the trial spin will take place some time in March unless there is some unforeseen hitch in the program. Several of the officers for the new vessel have arrived here and are watching the work with a good deal of interest. None of the sailors has yet appeared, but it is expected that the jackies will begin to arrive as soon as the trial trip comes off. The Chicago and Illinois people generally are taking a good deal of interest in the affair and it is expected that they will make the namesake of their state a present of one of the handsomest silver services ever given to a ship, if she comes up to their expectations.

Supt. Walter A. Post expresses himself as well pleased with the progress upon the immense repair job on the burned North German Lloyd steamer Main, which has been at the ship yard for several months being rebuilt. Most of the work done thus far has been down in the holds of the immense transatlantic liner. Nothing official has yet been received concerning the contract for the woodwork on this big repair job. If the ship yard secures this part of the work too the North German Lloyd people will pay the company something like $1,000,000 when the big ship is once more ready for service.

Everything is being placed in readiness for the launching of the Pacific Mail steamship Siberia, which is expected to go overboard about the middle of March. Her sister ship, the Korea, will go overboard a few weeks later.

Much interest is felt here in the constant rumors concerning the sale of the ship yard or its consolidation with some of the other great ship building interests of the country. The officials of the company invariably pronounce such rumors as groundless, but a bill which was passed by the recent special session of the Virginia general assembly is regarded as significant in this connection. The measure authorizes the company to dispose of its business and real estate holdings to any corporation now formed or which may be formed in the United States or in a foreign country.

Settlers' rates via the Nickel Plate road—Beginning with Tuesday, Feb. 12, low rate settlers' tickets will be on sale every Tuesday to and including April 30, to Oregon, Montana, Washington and all points in the Northwest. Write, wire, 'phone or call on the nearest agent, C. A. Asterlin, T. P. A., Ft. Wayne, Ind., or E. A. Akers, C. P. & T. A., Cleveland, O. 10 April 30.

The Marine Review wants a representative in every city on the Great Lakes.

Sealed proposals will be received at the office of the Light-house Engineer, Detroit, Mich., until 12 o'clock M., March 14, 1901, and then opened, for furnishing the material and labor of all kinds necessary for the erection of a combined light tower and fog signal house on the South Pier at entrance to Duluth Harbor, Minn., in accordance with specifications, copies of which, with blank proposals and other information may be had upon application to Major Thos. H. Handbury, Corps of Engineers, U. S. A.
Feb. 28.

U. S. Engineer Office, 1637 Indiana Ave., Chicago, Ill., February 4, 1901. Sealed proposals for dredging in Chicago Harbor will be received until 12 noon, central time, March 12, 1901, and then publicly opened. Information furnished on application. J. H. Willard, Maj., Eng'rs. Feb. 28.

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Send for Booklet with treatise on "Electrolysis of Condenser Tubes."

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New York, 253 Bd'wy. Boston, 172 High St. Chicago, Cor. Lake & Clark Sts.
V. WARING N.Y.

BELLEVILLE GENERATORS

Grand Prix 1889
Originated 1849

Hors Concours 1900
Latest Improvements 1896

Number of Marine Leagues made each year by Steamships of the Messageries Maritimes Co., Provided with Belleville Generators—Since their Adoption in the Service.

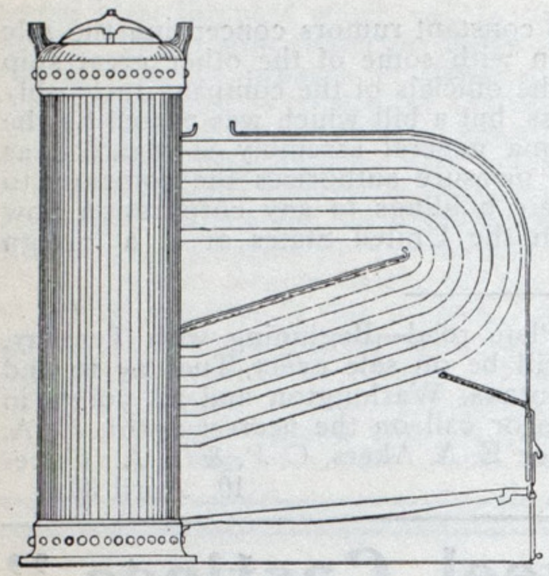
Year.	Australian	Polynesien	Armand Behic	Ville de la Ciotat	Ernest Simons	Chili	Cordillere	Laos	Indus	Tonkin	Annam
1890	22,576	820									
1891	22,749	22,777	68								
1892	22,749	22,801	23,274	7,753							
1893	22,793	22,781	22,762	22,749							
1894	22,813	22,789	22,858	22,813	12,567						
1895	22,891	22,922	22,913	22,936	13,629	9,571					
1896	23,178	30,906	23,232	23,183	20,735	21,051	13,572				
1897	22,750	23,202	30,912	23,185	20,745	25,370	21,119	14,382			
1898	23,646	23,178	23,184	23,199	20,842	21,080	21,080	20,851	21,318	7,569	
1899	23,178	23,205	22,477	30,135	20,082	20,926	20,956	17,448	18,285	14,669	7,628
Total	229,323	215,381	191,680	175,953	108,600	97,998	76,727	52,681	39,603	22,238	7,628

ATELIERS ET CHANTIERS DE L'ERMITAGE, À ST. DENIS (SEINE), FRANCE.
WORKS AND YARDS OF L'ERMITAGE ST. DENIS (SEINE), FRANCE.

TELEGRAPHIC ADDRESS: BELLEVILLE, SAINT DENIS, SUR SEINE.

THE AUTHENTIC WATER TUBE BOILER.

One of the devices approved by the United States board of supervising inspectors of steamboats at its meeting in Washington recently is the authentic water tube boiler, manufactured by Bugbee & Laycock, No. 128 South Clinton street, Chicago. As will be seen from the accompanying sketch, it consists of a vertical water column, which may be round or oblong with rounded ends. U-shaped tubes proceed from the side of the water column, pass over the fire box and return to the column at its upper end, being expanded into the column at both ends. These rows of tubes are about 4 in. apart and depart radially from the boiler and then turn and run parallel with each other over the furnace. Baffle plates over the fire-box door and the inner tubes force the flame to surround every tube for practically its entire length, and this, with the inclination of the tubes, gives rapid circulation and quick steaming. Water is carried at about the middle line of the boiler and the upper half of the column is used for separation. A recent test of a boiler 30 in. wide, 48 in. long and 54 in. high, gave 20 H.P. at 200 lbs. There were nine rows of tubes with four tubes in each row—thirty-six in all; 4 sq. ft. of grate surface; 98 ft. of heating surface and 250 lbs. of water; weight of boiler, filled, 1,600 lbs. Steam was made very rapidly and the circulation was surprisingly rapid. These boilers have been in use for two years on bad water without fouling the tubes, as all sediment is deposited in the base of the water column, the circulation being strong enough to keep the tubes clean. It may be built any size or shape, and its lightness and simplicity make it especially suitable for marine work.



The American Bridge Co. has received a contract for the steel work for an electric power plant to go to Ultimo, New South Wales, Australia.

VALUE OF STOCKS—LEADING IRON AND STEEL INDUSTRIALS.

Quotations furnished by HERBERT WRIGHT & Co., Cleveland, Date of February 27, 1901.

NAME OF STOCK.	OPEN	HIGH	LOW	CLOSE
American Steel & Wire.....	40½	41⅛	39⅝	40⅛
American Steel & Wire, Pfd.....	95½	97⅝	95½	9 ;½
Federal Steel	41¾	45¾	41½	41½
Federal Steel, Pfd.....	88	89¼	87¾	87⅞
National Steel	46½	47	45	45⅛
National Steel, Pfd.....	100¾	102	100	100
American Tin Plate	64	64	63	63
American Tin Plate, Pfd.....	100¾	102	100¾	100¾
American Steel Hoop.....	37	37½	36⅜	36⅜
American Steel Hoop, Pfd.....	82	83	81¼	81½
Republic Iron & Steel	14½	14½	14	14¼
Republic Iron & Steel, Pfd	62¾	63	62⅝	62⅝

Ahead of our Competitors.

That is what our customers say: With raw materials unequalled, with proficient chemical knowledge, technical skill and accuracy in manufacture, and with the best known machinery the superiority of

GARLOCK PACKINGS

naturally follows and its high reputation is merited. It is all carefully inspected and must be superior in quality and accurate in measurement, before shipment. Every pound is fresh and fully guaranteed. If you have never used GARLOCK PACKINGS your patronage is particularly solicited for a small trial order.

Send for catalogue and samples to our nearest office.

THE GARLOCK PACKING CO.

NONE GENUINE WITHOUT IT.

New York. Philadelphia. St. Louis.
Boston. Pittsburg. Denver.
Chicago. Cleveland. San Francisco.

MAIN OFFICES AND FACTORIES:
PALMYRA, N. Y.; ROME, GA.

Thearle's Works

ON SHIP BUILDING.

STANDARDS IN ENGLAND AND SCOTLAND

KNOWN AND USED WHEREVER STEEL SHIPS ARE BUILT.

SEPARATE VOLUMES FOR PLATES.

"Ship Building in Iron and Steel."
(Plates in separate volume.) $5.25.

"Ship Building and Laying Off."
(Plates in separate volume.) $3.00.

"Theoretical Naval Architecture."
(Plates in separate volume.) $3.50.

THE MARINE REVIEW PUB. CO,
CLEVELAND.

DELIVERY BOAT AND BOILER FOR SALE.

FIRE BOX BOILER—Allowed 116 lbs. steam pressure. In good condition. Cheap.

DELIVERY TUG NORRIS—48 ft. long, 11½ ft. beam, 4 ft. draught. Engine 8x8 in. New boiler 44 in. diam. by 84 in. high. Allowed 150 lbs. steam pressure. Lots of deck room. Handy boat. Price $1,250 cash.

HARDY & DISCHINGER,

Oils, Engineers' Supplies.

Agents Toledo White Lead Co. Feb. 28. TOLEDO, O.

STEAM YACHT FOR SALE.

A small, nicely-equipped, private steam yacht in perfect order. Dimensions: Over all, 57 ft.; beam, 8 ft.; draught, 4 ft. 2 in. Commodious forward and after deck with large pilot-house and comfortable trunk cabin. Having purchased a larger yacht, will sell this at a great sacrifice. Full particulars will be given by addressing O. P. Letchworth, Buffalo, New York. Mar. 28.

$350.00 BUYS PATENTS.

Balanced slide valve patent and water tube boiler patents. Approved by United States board of supervising inspectors of steam vessels, Feb. 7, 1901. G. Wolf, 232 Hamilton street, Cleveland, O. Feb. 28.

Schooner L. S. Hammond For Sale.

We offer this vessel at a very reasonable price. She is at our dock in this city, where she can be seen and examined. Full particulars will be given by calling at our office or writing to address below. Ogdensburg Coal & Towing Co., 44 & 46 North Water street, Ogdensburg, N.Y. Mar. 21.

LARGE STEEL PACKAGE FREIGHTER FOR SALE.

290 ft. keel, 41 ft. beam, 26 ft. hold; carrying capacity, 3,000 tons; highest rating for 5 years. Inquire J. K. Harrow, 225 6th St., Detroit, Mich. Feb. 28.

TUG FOR SALE AT A BARGAIN.

Fishing tug Fred King. One of the best on Lake Erie. Robison Basket Co., Painesville, O. Mar. 25.

Side-Wheel Passenger and Freight Steamer For Sale.

Built last season; 145x41 ft.; will sleep 100 first-class passengers and carry 125 tons of freight. Electric light plant and steam hoisting engines for freight. Vessel well fitted out. Nothing required to complete her. Forward main deck may be fitted to accommodate passengers. Will sell cheap. She is a Canadian bottom. Address or apply to S. R., Toronto Junction, Ont. Feb. 28.

FREIGHT AND PASSENGER STEAMER

A. B. Taylor is for sale. Vessel 106 ft. keel, 22 ft. beam. Freight capacity, 115 tons; passengers, 200. Electric light; good sea boat; speed, 11 miles; economical. E. C. Dunbar, Grand Haven, Mich. Mar. 7

LUMBER CARRIERS FOR SALE.

Stmr. White Star	capacity	350,000 feet.
Barge Eva S. Robinson	"	560,000 "
Schr. Annie P. Grover	"	340,000 "
Schr. John Miner	"	350,000 "

All A2 and A2½ and in good condition. Arthur B. Slyfield, Port Huron, Mich. Feb. 28.

FOUNDRY AND MACHINE SHOP FOR SALE.

To close an estate. Located in one of the large cities on the lakes. Long established, well equipped, doing good business, marine and general. Splendid chance for the right parties. Will sell plant or lease for a term of years. Address "Administrator," care Marine Review Pub. Co., Perry-Payne Bldg., Cleveland. tf.

TUG FOR SALE.

Good Tug, six years old. Engines 18x20. Boiler allowed 130 pounds steam pressure. Address Box 284, Ashland, Wis. Feb. 28.

FIVE ELECTRIC PASSENGER LAUNCHES FOR SALE.

In fine condition. Length over all, 35 feet. Seating capacity, 28. Send for price list. Yacht brokers, please note. Milwaukee Electric Launch Co., 1504 Monadnock Block, Chicago. tf